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CONTROL OF AIR POLLUTION
IN 1975

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OF THE
ADMINISTRATOR OF THE ENVIRONMENTAL
PROTECTION AGENCY

TO

THE CONGRESS OF THE UNITED STATES

IN COMPLIANCE WITH
THE CLEAN AIR ACT AS AMENDED

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PREFACE

The Clean Air Act, as amended, authorizes a national program of air pollution research, regulation, and enforcement activities. This program is directed at the Federal level by the U. S. Environmental Protection Agency (EPA). However, primary responsibility for the prevention and control of air pollution at its source rests with state and local governments. EPA's role is to conduct research and development programs, set national goals (via standards and regulations), provide technical and financial assistance to the states, and, where necessary, supplement state implementation and enforcement programs.

Section 313 of the Clean Air Act requires the Administrator to report yearly on measures taken toward implementing the purpose and intent of the Act. Section 313 reads as follows:

> "Not later than six months after the effective date of this section and not later than January 10 of each calendar year beginning after such date, the Administrator shall report to the Congress on measures taken toward implementing the purpose and intent of this Act including, but not limited to, (1) the progress and problems associated with control of automotive exhaust emissions and the research efforts related thereto; (2) the development of air quality criteria and recommended emission control requirements; (3) the status of enforcement actions taken pursuant to this Act; (4) the status of State ambient air standards setting, including such plans for implementation and enforcement as have been developed; (5) the extent of development and expansion of air pollution monitoring systems; (6) progress and problems related to development of new and improved control techniques; (7) the development of quantitative and qualitative instrumentation to monitor emissions and air quality; (8) standards set or under consideration pursuant to title II of this Act; (9) the status of State, interstate, and local pollution control programs established pursuant to and assisted by this Act; and (10) the reports and recommendations made by the President's Air Quality Advisory Board."

This report covers the period January 1 to December 31, 1975, and describes the issues involved in the prevention and control of air pollution and the major elements of progress toward that goal that have been made by EPA since the last report.

I. INTRODUCTION AND SUMMARY

This report reviews the progress that the U.S. Environmental Protection Agency (EPA) has made during the year 1975 in the control and prevention of air pollution. Chapter headings are taken from the topics listed in section 313 of the Clean Air Act, and additional measures of progress have been added where appropriate. The major events which took place during 1975 are briefly summarized here, grouped by topic, and are discussed more fully in the text of the report.

ATTAINMENT

- Of the 247 Air Quality Control Regions (AQCRs), 115 (47 percent) are judged likely to attain the primary National Ambient Air Quality Standard (NAAQS) for total suspended particulate (TSP) by the statutory date. Major factors contributing to non-attainment have been identified for many of these AQCRs, including fugitive dust (67 AQCRs), point sources (19 AQCRs), and smaller sources (14 AQCRs). It should be noted that some AQCRs have a combination of these problems.
- For sulfur dioxide (SO_2), 212 AQCRs (86 percent) are judged likely to attain the primary NAAQS by the statutory date. For the 35 AQCRs that are not expected to attain the standard, analysis shows the problem to be primarily emissions from large point sources;

further enforcement of existing regulations is expected to result in attainment of the SO_2 standard.

- Current data show that in a number of AQCRs the carbon monoxide (CO) standard is not being attained. When the Federal Motor Vehicle Emission Standards are fully implemented, however, the CO standard is expected to be attained in all but a few areas of the nation.
- The oxidant standard continues to be violated in many AQCRs, urban as well as rural. Research to better characterize the transport problems associated with oxidant is being emphasized along with the implementation of reasonably available control technology.

AIR QUALITY TRENDS

- Based on composite annual average data from 1000 TSP monitoring sites, the ambient concentrations have declined from 80 µg/m^3 to 66 µg/m^3 for the period 1970-1974.
- Based on composite annual average data from 258 SO_2 monitoring sites, the ambient concentrations have declined from 38 µg/m^3 in 1970 to 26 µg/m^3 in 1974.

STATE IMPLEMENTATION PLAN ISSUES

- For all non-attainment areas, the efforts of EPA and state/local agencies will focus on the control of emissions from existing sources in high-pollution AQCRs. Future action will be based on an analysis of the adequacy of the State Implementation Plan (SIP) and an emphasis on enforcement activities.

- Final designation of 168 Air Quality Maintenance Areas was published in 1975.
- EPA suspended indefinitely those portions of the indirect source regulations requiring pre-construction review of parking-related facilities.
- EPA's activities under ESECA -- review of coal conversion submittals and a review of State Implementation Plans -- were completed.

STATIONARY SOURCE REGULATIONS

- New Source Performance Standards (NSPS) for electric arc furnaces and five phosphate fertilizer processes were promulgated in 1975. NSPS for five more categories were promulgated in January 1976: primary copper, lead, and zinc smelters; coal cleaning plants; and primary aluminum reduction plants.
- In 1975 EPA promulgated regulations to implement section 111(d) covering emissions from existing sources of "designated" pollutants, i.e., those for which New Source Performance Standards have been set but for which National Ambient Air Quality Standards or National Emission Standards for Hazardous Air Pollutants do not exist.
- EPA promulgated revisions to the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for asbestos and mercury, modifying the scope of regulations and amending the test methods.
- Vinyl chloride was added to the list of hazardous air pollutants, and emission regulations were proposed on December 24, 1975.

- Continuous monitoring regulations were promulgated October 6, 1975.
- Modification regulations were promulgated December 16, 1975.
- Revisions to the Stage II Gasoline Vapor Recovery regulations were proposed October 9, 1975.

MOBILE SOURCE REGULATIONS

- EPA imposed interim standards of 1.5 grams/mile (g/mi) hydrocarbons (HC) and 15 g/mi CO for 1977 automobile emissions.
- EPA waived federal preemption for 1977 California State Motor Vehicle Pollution Control Standards of 0.41 g/mi HC, 9 g/mi CO, and 1.5 g/mi nitrogen oxides.
- During 1975 the certification of most 1976 model year light duty vehicles and light duty trucks was completed, and certification of 1977 models began.
- Notice of Proposed Rulemaking to control emissions from new motorcycles was published in October 1975.
- Notice of Proposed Rulemaking to set more stringent standards for evaporative emissions from light duty passenger vehicles and light duty trucks was published in December 1975. If the standards are promulgated at the proposed level, evaporative emissions will be reduced in 1990 by 3,350,000 tons/year.

STATIONARY SOURCE ENFORCEMENT

- During 1975, nearly 600 enforcement actions were initiated against stationary sources, bringing the total number since 1972 to about 1000.

- Of the approximately 20,000 identified major sources, 82 percent now comply with applicable emission limits or are meeting compliance schedules, an increase of almost 2700 over 1974.
- As of October 1975, 246 sources have been found subject to NSPS, and compliance levels of 89 percent have been achieved.
- Regulations were promulgated April 16, 1975, requiring compliance with both air and water standards by facilities involved in federal procurement activities.

MOBILE SOURCE ENFORCEMENT

- EPA conducted approximately 15,500 inspections of service stations to ensure compliance with the unleaded fuel regulations. Of the 15,000 samples taken, only 160 were found to be contaminated with lead. Approximately 3500 warnings and 260 complaints have been issued, and about $31,000 in penalties were collected in 1975.
- Four motor vehicle tampering cases have been successfully prosecuted in 1975, resulting in civil penalties of $4,950.
- Enforcement personnel conducted 68 inspections of domestic and foreign motor vehicle manufacturers and referred one investigation to the Justice Department for enforcement action.
- EPA monitored 1,186,769 vehicles voluntarily recalled by automobile manufactures for emission-related defects.
- Two cases were referred to the Department of Justice for alleged violation of motor vehicle import regulations.

LITIGATION

- The Supreme Court upheld EPA's policy on variances and has been petitioned to review Transportation Control Plans and feasibility issues related to State Implementation Plan development.
- Various Circuit Court decisions upheld EPA's positions on three major issues: the technical and economic analysis of the New Source Performance Standard for Portland cement kilns, the issue of dispersion technology vs constant controls, and the right for state and Federal enforcement actions to be brought against a polluter simultaneously.

RESEARCH

- The emphasis of health effects research during 1975 has been on pollutants which may result from energy sources other than petroleum.
- Epidemiologic studies of pollutants not subject to ambient air quality standards have been intensified. The pollutants include sulfates, nitrates, acid aerosols, and respirable particulates.
- Approximately $50 million was devoted to the development and demonstration of control technology for stationary source air pollution.

CONTROL AGENCY SUPPORT

- In 1975, 55 state and territorial agencies and 236 local agencies, working in coordination with states, expended approximately $140 million and 7000 man-years to carry out the major portions of the regulatory and enforcement aspects of the national air pollution control effort.

- In FY 75, state and local funds for air pollution programs increased 20 percent ($17 million) over FY 74 levels, and Federal support during this period increased by 2 percent ($1.6 million).

II. THE STATUS OF STATE IMPLEMENTATION PLAN APPROVALS, DISAPPROVALS, AND PROMULGATIONS, AND PROGRESS TOWARD ATTAINMENT OF NATIONAL STANDARDS

ATTAINMENT OF NATIONAL AMBIENT AIR QUALITY STANDARDS

The attainment date for primary standards in most states was May 31, 1975. Analysis is underway to determine the attainment status of each Air Quality Control Region (AQCR). Preliminary judgments have been made for each AQCR, but these will be subject to change as more data become available.

Significant progress in reducing levels of pollution has occurred. Since 1970, for example, the percentage of air monitors reporting values exceeding the primary (health) standard has decreased from 12 to 3 percent for sulfur dioxide, from 50 to 23 percent for total suspended particulate (TSP) annual average, and from 16 to 8 percent for TSP 24-hour average. The percentages for each of the compared years are based on the total number of pollutant-specific monitoring instruments reporting to SAROAD in those respective years.

Despite the very significant progress being made in improving air quality and reducing emissions, a number of AQCRs are not expected to attain one or more standards.

Total Suspended Particulate (TSP)

It is currently anticipated that 127 AQCRs (51 percent of all AQCRs) probably will not attain the TSP standard. A major problem in attaining the TSP standard is fugitive dust (discussed in the "SIP Developments" section of this chapter). Current analysis indicates that at least 67 AQCRs may not attain standards partly because of fugitive dust problems. Problems with major point sources are major contributing factors to probable non-attainment in approximately 19 AQCRs. EPA has also identified non-point sources as contributing to violation of the TSP standards in at least 14 AQCRs. Non-point sources are smaller sources which emit less than 100 tons per year of TSP.

It is important to note that in a given AQCR a number of factors, in combination, may be causing non-attainment of standards. Much of the analysis currently underway is directed at determining the causes of non-attainment and the extent to which each type of source contributes to non-attainment.

Sulfur Dioxide (SO_2)

Considerable progress has been made in attaining sulfur dioxide standards. On the basis of data currently available, EPA estimates that only 35 AQCRs (14 percent) will probably not attain. Of these 35 AQCRs, 28 are also not expected to attain the TSP standard. For the most part, the AQCRs which are experiencing problems in attaining the SO_2 standards have emissions from large point sources. In some 26 AQCRs major fossil fuel-burning power plants have been identified as contributing to the problem. In an additional three AQCRs, non-ferrous smelters are contributing to the problem. In most of these cases, the Agency believes that further enforcement of existing regulations will ensure attainment of the national SO_2 standards.

Carbon Monoxide and Photochemical Oxidants (CO and O_x)

The attainment of standards for carbon monoxide and photochemical oxidants in urban areas is in large part related to the control of transportation sources. A detailed discussion of EPA's efforts to control mobile source emissions is presented in Chapter V. Under the SIP process, transportation control measures have been promulgated in 27 cities to meet the oxidant standard, while transportation measures were promulgated in 26 urban centers for CO. An analysis conducted in the spring of 1975 indicated that the major urban areas in 79 AQCRs (32 percent) are reporting violations of the NAAQS for photochemical oxidants. The same review showed reported violations of the CO standard in 69 AQCRs (28 percent).

The carbon monoxide problem is associated almost entirely with motor vehicle emissions. It should be pointed out that, because of both administrative and legislative actions, the auto emission reductions originally required in the Clean Air Act have been deferred. Once Federal Motor Vehicle Emission Standards are fully implemented, the CO standard is expected to be attained in all but a few areas of the nation.

The photochemical oxidant problem is more complex and is a stationary source problem as well as a mobile source problem. Moreover, recent studies have found oxidant levels as much as twice the national standard in rural areas. Although oxidants can be formed from emissions from natural sources (e.g., coniferous forests), these recent studies indicate that oxidants, or their precursors, are advected into the rural areas from urban centers over a hundred miles distant. These studies provide preliminary evidence that, to attain the O_x standard, control of hydrocarbon stationary sources (i.e., petroleum refineries, coating operations, etc.) over wide areas surrounding cities may be needed in addition to controls in urban centers. Research in this area is continuing in order to better characterize the transport of oxidants and their formation.

Nitrogen Dioxide (NO_2)

Judgments concerning the attainment of the NO_2 national standards have been complicated by the discovery in 1973 that the ambient sampling method for this pollutant was faulty. The method that had been in use generally showed higher than actual levels of NO_2. An analysis of available data in the spring of 1975 indicated that only 16 AQCRs (6 percent) have NO_2 concentrations at or above NAAQS. It is important to note that this is a preliminary assessment which will be revised as more data become available.

Three alternative methods for measuring NO_2 were proposed on June 8, 1973. Since then further research has been conducted on each method. EPA now expects to promulgate a final reference method for NO_2 by mid 1976.

REVISIONS TO STATE IMPLEMENTATION PLANS

On April 30, 1971, EPA promulgated National Ambient Air Quality Standards (NAAQS) for five pollutants - sulfur dioxide, total suspended particulate, carbon monoxide, photochemical oxidants and nitrogen dioxide. Subsequent to that action, all states plus the four territories and the District of Columbia were required to submit a State Implementation Plan (SIP) to EPA which described the control actions to be taken to reduce ambient concentrations for each pollutant to levels at or below NAAQS. In most cases, the SIPs were required to demonstrate attainment of standards by May 31, 1975. Analysis is now underway to determine the final attainment status of each Air Quality Control Region (AQCR). EPA is and will be directing particular attention to those AQCRs which have not attained standards.

The passage of the May 31, 1975, attainment date for most areas marked a significant milestone in EPA's efforts to implement section 110 of the Clean Air Act Amendments of 1970. The initial efforts of EPA and the states were directed at the development of the SIPs and then their implementation. In the period from the first SIP approval/disapproval in 1972 until 1975, major emphasis was given to implementing the SIPs. In many states, particular sections of the SIP were revised by the state or EPA promulgated regulations to correct specific deficiencies. With the exception of the transportation measures, the majority of the revisions and promulgations addressed deficiencies in SIP elements other than the basic control strategies and emission limitations, and were intended to correct specific problems. With very few exceptions, there were no fundamental reassessments that led to major SIP revisions.

With the passage of the May 31 date, however, the states and EPA began an appraisal of the adequacy of all SIPs to attain and maintain standards. As a result of this appraisal, many SIPs will be revised in FY 1977 to make better provision for attainment and maintenance. These revisions will tend to be more comprehensive than those in the past. Although the revisions for attainment and for maintenance are related and in many cases will be handled together, the two concepts need to be differentiated.

A SIP revision for attainment of NAAQS is undertaken to make the SIP regulations stringent enough to bring ambient concentrations down to standards. In the majority of AQCRs where SIP revisions for attainment will be needed, the revisions will involve more restrictive emission limitations on presently regulated sources and/or the addition of new emission limits for sources not currently regulated. The actual emission limits will be based on a revised control strategy and will include all measures which it is reasonable to anticipate will be achievable within a reasonable period. If the revised emission limits are not sufficient to attain standards, additional measures such as transportation control will be required. However, the major emphasis in attainment planning will be on the control of emissions from existing sources that are contributing to violations of ambient standards. It should be noted that in an AQCR where the SIP is now substantially inadequate, SIP revisions for attainment will be made for the pollutant(s) for which a NAAQS is being violated. More specific considerations relative to attainment revisions are discussed in the section on "SIP Developments" in this chapter.

SIP revisions for maintenance of NAAQS will be considered in all areas where attainment revisions are necessary. In addition, maintenance revisions will be called for in designated Air Quality Maintenance Areas (AQMAs) where standards are being met, but where growth projections indicate that violations will occur within the next 10 years. Plan revisions for maintenance in most areas will deal primarily with the projected impact of growth and development of air quality. To maintain standards, the SIP revisions will not only need to address the basic control strategy and emission limits, but also may have to consider the review of new and modified sources, transportation controls, and land use. In addition, the establishment of solid working relations between air pollution control agencies and planning agencies, such as housing, transportation, Coastal Zone Management, etc., is being emphasized. The maintenance revisions to SIPs will be designed to prevent future violations of specific NAAQS which are projected to occur if control measures are not taken.

Regardless of whether violations are projected over the next 10 years, all SIPs must be adequate to provide for maintenance of standards in all areas and thus must contain provisions to ensure that unexpected growth does not cause violations. The primary mechanism to do this is the new source review procedure which includes an air quality analysis to decide whether a violation will occur. If the analysis indicates that the construction of a new source would cause a violation, the construction can be prohibited. However, maintenance (and attainment) of standards is not solely dependent on the SIPs developed under section 110 of the Clean Air Act. In addition to SIP procedures, certain Federal emission standards will help to ensure maintenance. In particular, New Source Performance Standards and Federal Motor Vehicle Emissions Standards are expected to contribute significantly to the maintenance of NAAQS.

In summary, the efforts of EPA and the states in non-attainment areas will focus on the control of emissions from existing sources in high-pollution AQCRs. SIP revisions for attainment will be developed with a primary emphasis on control strategies and emission limits to solve current problems. In maintenance, EPA and the states will focus on the management of growth to minimize any future adverse impact on air quality. SIP revisions for maintenance will be developed with a primary emphasis on methods for avoiding future problems from growth. In areas requiring SIP revisions for attainment, the attainment revisions will in most cases be followed by maintenance revisions. In both cases, attainment/maintenance revision areas and maintenance revision areas alone, the revisions will probably be more comprehensive in nature than those of the past three years. Finally, it should be noted that in both cases EPA is calling for revisions to the SIPS and not for new and separate plans.

Discussed below are the major national issues currently having an impact on the development of SIPs. Where possible, the issues are related to overall categories of attainment and maintenance.

SIP DEVELOPMENTS

Non-Attainment of NAAQS

Non-attainment of standards may result from one of two categories of causes. In the first place, non-attainment may be the result of incomplete implementation of the current SIP. In some non-attainment AQCRs, abatement work is still underway and there is a reasonable expectation that NAAQS will be achieved once it is completed. In such AQCRs, the emphasis for attainment is on continued compliance and enforcement work to ensure that current SIP regulations are fully implemented. A second category of cause for non-attainment is an inadequate SIP. In a number of non-attainment AQCRs, existing SIP regulations have been fully implemented and future improvements in air quality cannot be expected. In such AQCRs, it will be necessary to revise the SIP for attainment. To determine into which of the two categories above each AQCR falls, the states and EPA are currently conducting detailed reviews of the situation in each AQCR expected to show violations.

If SIP revisions for non-attainment are clearly necessary, EPA will issue a request for such revisions to the states by July 1976. The request will be as specific as possible in suggesting what new or revised regulations are needed. In most cases, the request will also call for SIP revisions for maintenance of NAAQS. The states will be asked to give priority to revising, within one year, the existing emission limitations as needed. The revisions are to demonstrate attainment of standards as expeditiously as practicable; in most cases, this will have to be less than three years. If other measures, such as transportation control measures, are needed to attain and maintain NAAQS, they will be submitted within two years of the initial call for revisions.

To avoid interrupting compliance activities in the preparation of the revisions, adding regulations to cover new sources not affected by present regulations is preferred over revising existing regulations. EPA is making every effort to ensure that the impact of attainment revisions on on-going abatement will be minimal.

Maintenance of NAAQS

As a result of a 1973 court decision, EPA reviewed each SIP regarding the maintenance of NAAQS and found that no plan adequately provided for the maintenance of standards past 1975-77. EPA then promulgated in the June 18, 1973, Federal Register (38 FR 15834) requirements that each implementation plan provide for the long-term maintenance of standards, including the requirement that the plans list potential problem areas where standards were or, because of projected growth, could be exceeded. The Federal Register notice required that the SIPs be revised in the potential problem areas (AQMAs) by June 18, 1975, to provide for maintenance of standards for the following 10 years. In Federal Register actions of June 19, 1975 (40 FR 25814), and October 20, 1975 (40 FR 49048), the date for submission and the planning period requirements were revised. Instead of requiring uniform dates and planning periods, the new proposed regulations allow the Administrator some flexibility in tailoring the requirements to an area's needs.

Whereas the original SIP revisions for maintenance were to have provided for a period of 10 years, the requirements now allow the Administrator to specify the period of time over which the revisions must demonstrate maintenance. Most plan revisions will probably cover 10 years, but they must address the same period as other federally sponsored plans when such plans address different planning horizons.

Flexibility has also been introduced in the dates for AQMA plan revision submission. The initial analysis of the problems in the AQMA are due by April 1, 1976, but the Administrator can modify that date. The dates for final plan revision submission will vary. However, the regulations require that they be submitted "as expeditiously as practicable" for areas that will fail to maintain NAAQS in the near future. For areas where maintenance is a longer term problem, the maintenance revisions will generally be required a number of years before they are to be implemented.

In a series of three *Federal Register* actions to date, the Administrator has identified a total of 168 AQMAs for at least one pollutant. Of these, 159 were identified for total suspended particulate, 61 for sulfur dioxide, 24 for carbon monoxide, 49 for photochemical oxidants, and 5 for nitrogen dioxide. Under the proposed regulations no additional areas will be formally identified. However, the states would still have to reassess all areas periodically to determine if any areas need revisions.

Fugitive Emissions

During the development of the original SIPs, control strategies for total suspended particulates (TSP) focused on the control of emissions from the primary exhaust systems of point sources. Since that time, EPA and the states have become increasingly aware that the attainment and maintenance of the TSP standard may be adversely affected by both fugitive emissions and fugitive dust emissions. Fugitive emissions are generated from industrial operations and are released to the atmosphere through windows, doors, roof vents, etc., but not through the primary exhaust system. On the other hand, fugitive dust emissions result from the force of the wind or man's activity on the land. This latter category includes windblown particulate from crop land, unpaved roads, and exposed areas at construction sites, as well as particulate reentrained from streets by automobiles, tilling of crop land, etc. Both types of emission are very difficult to quantify and, as a result, the relative magnitude of the problem can only be estimated. However, some 67 AQCRs, primarily in the West, are estimated to have problems in attaining the TSP standard because of fugitive dust.

In the current round of revisions for attainment/maintenance, some SIPs may be revised to include regulations for fugitive emissions. It is possible to specify equipment standards for fugitive emissions from some industrial sources. In addition, a visible emission regulation can be used to force fugitive emission reductions. Although some controls for fugitive dust emissions are available, NAAQS are probably not attainable in areas where the principal problem is natural dust storms. Therefore, a number of AQCRs will continue to experience violations of the standard because of fugitive dust emissions.

Continuous Emission Monitoring

When the SIPs were first developed, it was EPA's position that continuous in-stack emission monitoring systems were not sufficiently reliable to warrant their inclusion as an SIP requirement. However, the states were required to have the legal authority to require them. Since then, the technology of in-stack monitoring has advanced sufficiently for EPA to define realistic performance specifications for continuous monitors for certain sources. In the Federal Register of October 6, 1975 (40 CFR 46240), the Agency promulgated two regulatory actions that require the continuous monitoring of emissions from a number of specified sources. One regulation required continuous monitoring for certain new sources under EPA's New Source Performance Standards program. The second regulatory action required the states to adopt regulations to require emission monitoring on some existing sources whose emissions are limited by regulations included as part of an approved SIP. The source operators will be required to report excess emissions, their cause and any downtime in the continuous monitoring system. Once the state submits such regulations and has them approved by EPA, sources will have up to 18 months to acquire, install and begin to operate the required monitoring systems. Table II-1 lists the sources that will be affected if they are covered by emission standards which are part of an approved SIP.

Prevention of Significant Deterioration of Air Quality

In accordance with a court order resulting from a suit filed by the Sierra Club, EPA has disapproved all SIPs with respect to significant deterioration of air quality and has promulgated regulations applicable nationwide. The regulations require the preconstruction review of any new or modified source in 19 major source categories commencing construction after June 1, 1975, to ensure that best available control technology is installed and to ensure that specified air quality increments will not be exceeded. The Class I increments would permit very little change in air quality, Class II would permit changes consistent with moderate, well-controlled growth, and Class III would permit deterioration up to but not exceeding the most restrictive national standards. All areas of the country were designated Class II initially, with provisions for states, Federal Land Managers, or Indian Governing Bodies to initiate reclassifications for land under their control.

Generally, the states have not initiated action to reclassify areas from Class II to Class I or III, have not requested authority to carry out EPA's regulations, and have not submitted their own plans to prevent significant deterioration. Therefore, EPA is presently implementing its own regulations on a nationwide basis. The states would prefer to wait for Congressional action on this issue before taking any steps or action.

Table II-1. MONITORING REQUIREMENTS FOR EXISTING SOURCES SUBJECT TO EMISSION LIMITATIONS AS PART OF AN APPROVED IMPLEMENTATION PLAN

Source category	Monitor required
Fossil fuel-fired steam generators > 250 x 10^6 Btu/hr heat input and > 30 percent annual capacity factor	Opacity,[a] SO_2,[b] NO_x,[c] O_2 or CO_2[d]
Sulfuric acid plants > 300 tons/day (100 percent acid)	SO_2
Nitric acid plants > 300 tons/day (100 percent acid)	NO_x[e]
Petroleum refineries catalyst regenerators > 20,000 bbls/day fresh feed to fluid catalytic cracker	Opacity

[a] Only solid fuel-fired or liquid fuel-fired with a record of violation of the opacity standard in the applicable plan.

[b] Only for units using flue gas desulfurization equipment.

[c] Only for units > 1000 x 10^6 Btu/hr heat input in AQCRs where EPA has determined that a control strategy for NO_2 is necessary.

[d] O_2 or CO_2 monitors are required only if needed to convert NO_x or SO_2 data to the units of the standard.

[e] Only in AQCRs where EPA has determined that a control strategy for NO_2 is necessary.

Sixteen separate suits have been filed on EPA's promulgated regulations (one environmental group, one state, and fourteen industrial petitioners). These have all been consolidated in the U.S. Court of Appeals for the District of Columbia Circuit. Briefs for both sides have been filed and a decision is expected in 1976.

Indirect Sources

On June 30, 1975, EPA suspended indefinitely those portions of the indirect source regulations requiring pre-construction review of parking-related facilities, as required by the FY 1975 appropriation act for the Agency. Not affected were those provisions pertaining to highways and airports. Indirect source reviews are similar in purpose to other new source reviews. They are conducted to prevent the violation of a NAAQS by emissions caused by a new source. As such, indirect source reviews are part of the overall maintenance effort.

The Congress is presently considering the matter of indirect source review, and the Agency expects guidance on this and other matters in the form of amendments to the Clean Air Act.

Technical guidance for developing indirect source plans has been made available to control agencies in Guideline for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources (EPA 450/4-75-001).

Seventeen states/territories have submitted plans for regulation of indirect sources. Plans have been approved for Alabama, Florida, Guam, Idaho, Kentucky, Nebraska, Nevada, New York, North Carolina, Virgin Islands, and West Virginia. Plans are under review for Connecticut, Delaware, New Hampshire, Oregon, Pennsylvania (Philadelphia only), and Virginia.

Tall Stacks

Tall stacks and the related issue, supplementary control systems, are control strategies which reduce the impact of emissions from combustion sources on air quality at ground level. Neither technique directly involves the use of control equipment. Instead, both techniques rely upon atmospheric dispersion to reduce the atmospheric concentrations of pollutants, and both do little to reduce actual emissions. The use of tall stacks relies on stack height increases to aid the dispersion of pollutants, thereby reducing ground level concentrations, in some cases below the level needed to attain NAAQS. Supplementary control systems involve restrictions or modification to source operations during periods of poor atmospheric dispersion so as to reduce emissions.

On February 8, 1974, a U.S. Court of Appeals opinion stated that dispersion techniques could not be employed as substitutes for available emission controls. The Agency has since prepared guidance setting forth a uniform policy on the use of stack height increases by emitters. This policy is applicable to a wide variety of sources and will give greater assurance that NAAQS will be attained and maintained. The general philosophy of the policy is that stack height increases are acceptable interim control strategies on existing sources only after on-line installation of all reasonably available control technology. Stack height augmentation will not allow for any process operation modifications which would increase emission levels at a source.

The policy guideline addresses the application of stack height increases to both new and existing sources. This guidance provides a system in which air quality and existing stack height are factors for determining compliance in any future control strategy demonstrations.

Supplementary Control Systems

Development continues on control plans that would permit the temporary use of supplementary control systems for SO_x on existing non-ferrous smelters in several western states where the use of all reasonably available emission controls is inadequate to attain ambient standards. EPA has proposed and promulgated such regulations for Idaho and Nevada and proposed regulations for Arizona and New Mexico.

Under these regulations, smelters are allowed to restrict or to modify operations as necessary to permit adequate dispersion of pollutants as long as reasonably available control technology is applied and the source accepts responsibility for any violations of ambient standards within its designated liability area.

The strategy preferred by EPA for attaining and maintaining NAAQS is one of constant emission limitation. The regulations state that supplementary controls may be used only as a temporary measure to augment constant control techniques, where the alternatives would be permanent curtailment or cessation of production or delays in attaining air quality standards.

The final regulation in Nevada was challenged in court by an affected emitter wishing to use SCS as a permanent control measure. However, EPA's regulation was found valid, and the Agency is continuing to develop regulations for the states involved.

Energy Supply and Environmental Coordination Act (ESECA)

EPA's activities under ESECA were of two major types in 1975 -- review of coal conversion submittals and a review of State Implementation Plans.

Review of Coal Conversion Submittals -- As of November 3, 1975, EPA was involved in actions on 32 power plants in six EPA Regions. The air pollution requirements fall into two general categories:

(1) The emission-limiting regulations of an applicable SIP. If the source is located in an AQCR where the primary NAAQS for a pollutant is not being met, then the SIP regulation for that pollutant must be met at the time the source converts to coal. This situation existed for five plants for both TSP and SO_2 and 21 plants for TSP only, as of November 3, 1975.

(2) Primary standard conditions. If the SIP regulation need not be met at the time of conversion, EPA may specify interim requirements, called primary standard conditions, to assure that primary NAAQS are not violated. SIP requirements must be met as soon as practicable but not later than January 1, 1979. As of November 3, 1975, two plants for TSP and possibly 11 plants for SO_2 are eligible for operation under primary standard conditions.

In either case, the source cannot proceed to convert to coal until EPA approves a source-submitted schedule for complying with SIP regulations as soon as practicable, but no later than January 1, 1979.

State Implementation Plan Reviews

In compliance with section 4 of ESECA, EPA completed (in March 1975) a review of each State Implementation Plan to determine if emission-limiting regulations for stationary fuel-combustion sources could be revised without jeopardizing the attainment and maintenance of any NAAQS. The main objective of the reviews was to stimulate a change of regulations that generate unnecessary demands for clean fuels or other control techniques.

Fifty-five states and territories (encompassing all 247 AQCRs) were evaluated for both TSP and SO_2. Also, regulations for the control of NO_2 were evaluated for a limited number of AQCRs in New York, Maryland, Illinois, California, and Utah. Hydrocarbon and carbon monoxide regulations were not addressed in the reviews because they do not -- with regard to stationary fuel combustion sources -- constitute a major part of the strategy to attain and maintain NAAQS or pose a roadblock to fuel use.

The reviews found that emission-limiting regulations for NO_2 are necessary and are not unduly restrictive in the context of section 4 of ESECA. The reviews found little indication that emission-limiting regulations for TSP are overly restrictive. Of 247 AQCRs, 30 were found to be good candidates for possible revision of TSP regulations and the remaining 217 were found to be marginal or poor candidates. With regard to the limitations placed on SO_2 emissions, the reviews found that the EPA's clean fuels policy of encouraging states to revise unnecessarily restrictive regulations has already reduced much of the "overcleaning" required by the original SIPs. Only four states were found to have some (very limited) potential for SO_2 regulation revisions; these states had not initiated SIP revisions at the time of the study.

APPROVAL/DISAPPROVAL STATUS OF IMPLEMENTATION PLANS

Each state has submitted a SIP for EPA approval as required by the Clean Air Act Amendments of 1970. Under the Act, EPA has authority to propose and promulgate regulations to overcome regulatory deficiencies in each SIP. Under this authority, the Agency has maintained an ongoing review of SIPs to identify regulatory deficiencies. Identified deficiencies can arise from a number of different factors. A major factor has been the better air quality and emission data now available on which to base control strategies. Other major factors have been the court rulings and interpretations which have necessitated a number of revisions to the original SIPs. The introduction of new control technology has also necessitated revisions.

As a result of all these factors, SIPs have been evolving and changing to meet new situations. The SIP should be seen as a process and not a static plan.

Table II-2 reports the approval/disapproval status of each SIP for three key sections. The New Source Review section of a SIP is especially important as EPA and the States begin to move into a maintenance mode. The pre-construction review required under New Source Review includes both a review against emission limits and a review for air quality impact. These reviews will help to maintain standards. The transportation measures included in some SIPs are a part of overall control strategies for O_x and CO. The measures listed in Table II-2 are, primarily, those needed to control and manage emissions from mobile sources. Additional control measures for O_x and CO are contained in the emission limitation section of each SIP. These are measures to control emissions from stationary sources. Emission limitations for each criteria pollutant are a part of each SIP. These limitations are designed to reduce emissions and bring ambient concentrations down to NAAQS. These limitations apply to existing sources of pollution, but they are also used, as noted above, as one part of a review of proposed new sources. Regarding emission limitations, it should be noted that in many cases the measures listed in Table II-2 apply to only one AQCR. Additional details can be found in the *State Air Pollution Implementation Plan Progress Report, January 1 to June 30, 1975* (EPA 450/2-75-008, September 1975).

Finally, it should be pointed out that this table reports the status of SIPs before the calls for attainment and maintenance revisions. Calls for these revisions will be made before June 1976 and will result in new control strategy proposals being listed in the next report.

Table II-2. STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region I			
Connecticut	Approved	Measures are required for Hartford-New Haven-Springfield AQCR and New York-New Jersey-Conn. AQCR	Approved
Maine	Approved	None required	Approved
Massachusetts	Approved	Boston transportation controls promulgated 6/12/76	Promulgation for SO_x (12/76-sulfur content of fuel). Approved for other pollutants
New Hampshire	Approved	None required	Promulgation for TSP (11/76), approved for other pollutants
Rhode Island	Approved	Measures required; hearing 11/76	Approved
Vermont	Approved	None required	Approved
Region II			
New Jersey	Approved	Measures promulgated for Philadelphia and New York, New Jersey and Conn. AQCRs	EPA promulgation (7/73) for HC, approved for other pollutants
New York	Approved 9/16/76	TCP measures needed for New York-New Jersey-Conn. AQCR, Gennessee-Finger Lakes AQCR, and Central New York AQCR	Rulemaking for SO_2 (6/76), approved for other pollutants

Table II-2 (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region II cont.			
Puerto Rico	Approved	None required	Deficient in part for SO_2 (6/76), approved for other pollutants
U.S. Virgin Islands	Approved for all except public comment provisions (6/16/76)	None required	Approved
Region III			
Delaware	Approved	None required	Approved
District of Columbia	Approved	Measures promulgated for National Capital AQCR	Approved
Maryland	Approved	Measures promulgated for Baltimore and National Capital AQCRs	TSP limitations proposed (10/6/75); SO_2 regulation amended to delete reduction from 1.0 to 0.5% sulfur fuel for all AQCRs except Baltimore where the regulation is only deferred until 7/1/76 (12/5/75); approved for other pollutants
Pennsylvania	Approved	Measures promulgated for Philadelphia and Southwest Pennsylvania AQCRs	State proposals for TSP and SO_2; approved for other pollutants

Table II-2 (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region III cont.			
Virginia	Approved	EPA promulgation for National Capital AQCR	Approved
West Virginia	Approved (11/10/76)	None required	Approved
Region IV			
Alabama	Approved	None required	Proposal for SO_2 (8/76, 7/76), promulgation for TSP (6/75, 8/76), proposal for TSP (7/76), approved for other pollutants
Florida	Approved	None required	Promulgation for SO_2 (10/76), Approved for other pollutants
Georgia	Approved	None required	Promulgation for TSP (10/76), promulgation for NO_2 (6/76). Approved for all other pollutants
Kentucky	Approved	None required	Approved
Mississippi	Approved	None required	Approved
North Carolina	Approved	None required	Approved

Table II-2 (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region IV cont.			
South Carolina	Approved	None required	Approved
Tennessee	Approved	None required	Approved
Region V			
Illinois	Approved	Measures promulgated for Chicago AQCR	CO strategy disapproved 6/73; approved for other pollutants
Indiana	EPA promulgations (5/73 & 2/74)	EPA promulgation (4/74) for Indianapolis AQCR	Approved
Michigan	EPA promulgation (10/72)	None required	Approved
Minnesota	Approved	Measures for Minneapolis-St. Paul AQCR	Approved
Ohio	EPA promulgation (4/74)	Measures promulgated for Cincinnati AQCR	HC strategy disapproved, SO_2 strategy proposed (11/76), approved for other pollutants
Wisconsin	Approved	None required	Approved
Region VI			
Arkansas	Approved	None required	Approved
Louisiana	Approved	None required	Approved

Table II-2 (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region VI cont.			
New Mexico	Approved	None required	Revocation of EPA promulgation for SO_2 proposed 11/78, approved for other pollutants
Oklahoma	Approved	None required	Approved
Texas	Approved	Measures being prepared for Austin-Waco, Corpus Christi, Houston-Galveston, Dallas, San Antonio, El Paso	EPA promulgations for HC (11/73), approved for other pollutants
Region VII			
Iowa	Approved	None required	Approved
Kansas	Approved	None required	Approved
Missouri	Approved	Measures submitted for St. Louis AQCR	Approved
Nebraska	Approved	None required	Approved
Region VIII			
Colorado	Approved	Measures promulgated for Denver AQCR	Approved
Montana	Approved	None required	Proposal for SO_2 (10/78), approved for other pollutants
North Dakota	Approved	None required	Approved

Table II-F (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation controls	Emission limitations
Region VIII cont.			
South Dakota	Approved	None required	Approved
Utah	Disapproved for TSP in Wasatch Front AQCR, other sections approved	EPA promulgation for Wasatch Front AQCR (11/73)	EPA promulgations for SO_2 and TSP (6/74 and 9/74), TSP promulgation (smelter) 11/76, approved for other pollutants
Wyoming	Approved	None required	Approved
Region IX			
American Samoa	Approved	None required	Approved
Arizona	Approved, except for Pima County	Measures in effect for Phoenix-Tucson AQCR	EPA promulgations for SO_2 (3/73 and 3/74), TSP (6/73), proposal for SO_2 from smelters (10/76), approved for other pollutants
California	EPA promulgation (4/73) for part of state	Measures promulgated for San Francisco, Los Angeles, San Diego, Fresno, and Sacramento AQCRs	EPA proposals for TSP and promulgation for HC, approved for other pollutants
Guam	Approved	None required	Approved
Hawaii	Approved	None required	Approved

Table II-2 (continued). STATUS OF SELECTED PORTIONS OF THE STATE IMPLEMENTATION PLANS

Region/state	New source review	Transportation measures	Emission limitations
Region IX cont.			
Nevada	EPA promulgation (4/73) for Washoe County	None required	EPA promulgation for SO_2 (9/75), disapproved for TSP (no promulgation to date), approved for other pollutants
Region X			
Alaska	Approved	EPA promulgation for Northern Alaska AQCR	Revisions needed for CO, approved for other pollutants
Idaho	Approved	None required	Promulgation for SO_2 (11/75), approved for other pollutants
Oregon	Approved	None required	Approved
Washington	Approved	Promulgations for Seattle and Spokane AQCRs	Approved

III. DEVELOPMENT OF AIR QUALITY CRITERIA AND RECOMMENDED EMISSION CONTROL REQUIREMENTS

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

EPA has a continuing program for reviewing the existing scientific data base for the criteria pollutants (those for which NAAQS have been established) and for assessing the need for establishing new air quality standards for other pollutants. Updates of the scientific data bases for standards for carbon monoxide, oxidants and related hydrocarbons, and oxides of nitrogen were initiated during 1975. In addition, four scientific and technical assessment reports were published during the year: Manganese, Cadmium, Particulate Polycyclic Organic Matter, and Vinyl Chloride and Polyvinyl Chloride. Vanadium, Lead from Stationary Sources, and Nickel are in the final clearance stage. Nitrosamines and Arsenic are in various stages of preparation.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

New source performance standards (NSPS) were promulgated in 1971 for five categories and in 1974 for seven more categories. Twelve additional source categories were proposed in 1974. Half of these (electric arc furnaces and five phosphate fertilizer processes) were promulgated in 1975. NSPS for primary copper, zinc, and lead smelters, coal cleaning plants, and primary aluminum reduction plants were promulgated in January 1976. Seven additional promulgations (ferroalloy production, grain terminals, by-product coke ovens, coal-refuse combustion in steam generators, carbon black, lignite-fired steam generators, and crushed stone) are expected during 1976. In addition, 15 source categories are scheduled for promulgation in 1977-78, and many more categories are being studied for possible promulgation.

Significant issues were raised during the year concerning control costs, continuous monitoring, modification provisions, and application of section 111(d) of the Act. Resolution of these policy and technical questions has required considerable effort, as has the decision to include environmental and inflation impact statements in the standard support documents.

Continuous monitoring regulations were promulgated on October 6, 1975. These establish a procedure whereby continuous emission monitors are checked against manual performance tests required of new sources. Performance specifications for acceptable monitors are included in the regulations.

On November 17, 1975, regulations to implement section 111(d) of the Clean Air Act were promulgated. Under section 111(d) states are required to submit plans for the control of designated pollutants (i.e., those pollutants for which no National Ambient Air Quality Standards or National Emission Standards for Hazardous Air Pollutants have been established) from existing sources after the Agency promulgates NSPS for that source category. Modification regulations, promulgated December 16, 1975, better define the types of physical changes, changes in operations, and reconstruction that will subject existing sources to NSPS.

Eight AQCRs received assistance in the form of NSPS-type technical studies and specific test methodology when the Agency proposed revisions to the Stage II Gasoline Vapor Recovery regulations on October 9, 1975.

A strategy has been established for setting additional NSPS to minimize projected increases in nationwide emissions. Over the next 15 years, up to 400 pollutant/source combinations of NSPS will be promulgated. The effect of these standards will be to maintain particulate, SO_x, HC and CO emission levels at or below present levels despite projected industry production increases.

Table III-1. STATUS OF STANDARDS OF PERFORMANCE

Source	Affected facility	Pollutant	Promulgation date	Remarks
Steam generators (>250 million Btu/hr)	Coal-, oil-, and gas-fired boilers	Particulate SO_2 NO_x	12/23/71	Under remand
Municipal incinerators (>50 tons per day)	Incinerator	Particulate	12/23/71	
Portland cement plants	Kiln, clinker cooler	Particulate	12/23/71	Judicial review decided in favor of EPA-[illegible]
Nitric acid plants	Process equipment	NO_x	12/23/71	
Sulfuric acid plants	Process equipment	SO_2 Acid mist	12/23/71 12/23/71	Under remand
Asphalt concrete plants	Process equipment	Particulate	3/8/74	Undergoing judicial review
Petroleum refineries	Process gas combustion	SO_2	3/8/74	
	Catalytic regenerators	Particulate CO	3/8/74 3/8/74	
Petroleum storage	Gasoline, crude oil, and distillate storage tanks >65,000 gallons capacity	Hydrocarbons	3/8/74	
Secondary lead smelters and refineries	Blast and reverberatory furnaces	Particulate	3/8/74	
Secondary brass and bronze refining facilities	Reverberatory furnaces	Particulate	3/8/74	
Iron and steel mills	Basic oxygen furnace	Particulate	3/8/74	

Source	Affected facility	Pollutant	Promulgation date	Remarks
Sewage treatment plants	Sludge incinerators	Particulate	3/8/74	
Primary copper smelters	Roaster, smelting furnace, converter Dryer	SO_x Particulate	1/15/76	
Primary zinc smelters	Roaster Sintering machine	SO_x Particulate	1/15/76	
Primary lead smelters	Sintering machine, electric smelting furnace, converter	SO_x	1/15/76	
	Blast or reverberatory furnace, sintering machine	Particulate		
Primary aluminum reduction plants	Pot lines Anode bake plant	Fluorides Fluorides	1/26/76	
Coal cleaning plants	Air tables Thermal dryers	Particulate Particulate	1/15/76	
Phosphate fertilizer plant	Wet process phosphoric acid	Fluorides	8/6/75	
	Superphosphoric acid	Fluorides	8/6/75	
	Diammonium phosphate	Fluorides	8/6/75	
	Triple superphosphate	Fluorides	8/6/75	
	Triple superphosphate storage	Fluorides	8/6/75	

Table III-1 (continued). STATUS OF STANDARDS OF PERFORMANCE

Source	Affected Facility	Pollutant	Promulgation date	Remarks
Iron and steel mills	Electric arc furnaces	Particulate	9/23/75	
Ferroalloy production	Specific furnaces	Particulate		Proposed 10/21/74
		CO		Promulgation scheduled for mid-1976

Table III-2. REGULATORY ACTIONS RELATED TO SECTIONS 111 AND 112

Subject of regulation	Affected facility	Pollutant	Promulgation date	Remarks
Continuous monitoring			10/6/75	
Section 111(d) regulations			11/17/75	
Modification			12/16/75	
Revision to hazardous pollutant regulations		Asbestos and mercury	10/14/75	
Vinyl chloride	Process equipment	Vinyl chloride		Proposed 12/24/75

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs)

On October 14, 1975, the Agency promulgated revisions to the asbestos and mercury National Emission Standards for Hazardous Air Pollutants (NESHAPs). These revisions modify the scope of the regulations and amend the test methods. For asbestos, manufacture of shotgun shells, manufacture of asphalt concrete, and asbestos waste disposal were added to the list of nine source categories covered by the regulations. Asbestos fabrication operations are excluded, and changes have been made in preventing emissions during demolition and renovation. Sewage sludge incinerators were added as a source of mercury emission covered by NESHAPs.

On December 24, 1975, EPA added vinyl choloride to the list of hazardous air pollutants and proposed a standard for vinyl chloride emissions from ethylene dichloride/vinyl chloride and polyvinyl chloride plants.

HEALTH EFFECTS RESEARCH

Research on health effects is fundamental to the Agency's responsibility and ability to develop criteria and to promulgate and enforce standards and guidelines. The effort is specifically designed to identify pollutants which may pose a risk to health, to quantify the relationships between exposure to these pollutants and their effects on health, and to document the benefits of reducing or eliminating human exposure through pollution control. In the health effects program, data bases are developed for determining whether restricting exposure to particular pollutants is necessary to protect public health and, if so, to what degree exposure should be restricted. To do this, a combination of research approaches is used: toxicological studies which utilize animal models, human clinical studies, and epidemiological studies of human populations in their actual environmental settings.

The health effects research program is basically divided into four pollutant areas: studies on criteria pollutants, non-criteria pollutants, pollutants associated with transportation activities, and non-pesticide organic and inorganic substances.

Criteria Pollutants

Criteria pollutants are those for which National Ambient Air Quality Standards (NAAQS) have been set: carbon monoxide, sulfur dioxide, nitrogen dioxide, particulates, hydrocarbons, and oxidants. The Agency is continuing to obtain health effects information on these pollutants in several areas, such as exposure averaging times -- that is, short-term, high-concentration exposure versus long-term, low-level exposure -- the adequacy of existing safety margins, the health benefits of meeting the standards, and the health risks of exceeding the standards. Thus, the research in this area is basically directed toward expanding the health data base for those pollutants for which NAAQS have been promulgated and refining the criteria on which those standards are based. Any evaluation and adjustment of the standards which may prove to be necessary will be influenced substantially by these data.

Studies are also being conducted in the criteria pollutant area to identify populations most at risk, to refine exposure-effects data for such populations, and to determine the effects of exposure to combinations of the criteria pollutants.

Non-Criteria Pollutants

Non-criteria pollutants are those for which no NAAQS have been established. Health effects research is also directed toward developing data on these pollutants, e.g., sulfates, nitrates, and respirable particulates. Some existing evidence associates these pollutants with harmful effects on human health. Questions being posed in this regard include determination of exposure-response relationships for these pollutants, both by themselves and in combination with other pollutants.

During this year, the Agency reoriented the air epidemiology program into targeted population studies designed to test hypotheses developed from the earlier Community Health and Environmental Surveillance System (CHESS). Specific studies on sulfate and nitrate aerosols are part of the series. For example, studies were begun in the South Coast Air Basin of California, where a special problem may emerge as the use of fuels containing higher proportions of sulfur is increased in an area of high oxidant levels. Studies have been planned in the Northwestern Intermountain Region where high sulfate levels occur in conjunction with smelter operations. Further studies are designed for the highly industrialized areas east of the Mississippi and south of the Great Lakes where the potential exists for large, regional sulfate problems arising from long-term transformation and long-range transportation of sulfur oxides emitted largely from stationary sources.

Transportation-Associated Pollutants

A specially identified area of research in air pollution relates to transportation. The purpose of this program is to develop comprehensive toxicological and epidemiological data bases on the public health consequences of pollutants stemming from transportation sources. We are conducting a series of studies to ascertain health risks associated with emission products such as sulfuric acid, sulfates, carbon disulfide, hydrogen sulfide, palladium, platinum and aluminum oxide from vehicles equipped with catalytic converters. The effects of substances used as fuel additives are also being investigated, and plans to begin work on possible biological effects of diesel emissions have also been made.

The annual Catalyst Research Program Report represents a comprehensive compilation of information obtained by a research program on mobile source emissions. The work includes data on emission characterization, atmospheric chemistry, and physics of mobile emission products with consideration given to meteorology and other atmospheric factors; air quality modeling; animal toxicology; and human population effects. Pollutants of concern include acid sulfates, platinum, and palladium. The data obtained is being provided to appropriate sectors of the Agency to indicate the public health implications of non-regulated mobile source pollutants so that prudent determinations can be derived with respect to regulatory needs.

Inorganic and Organic Substances

Non-pesticide inorganic and organic substances are also topics of investigation in the air program area. The health program addresses a number of trace metals, including cadmium, copper, zinc, arsenic and lead. Lead, for example, is a ubiquitous pollutant which may be found in the air we breathe, the water we drink, the food we eat, and dust that children sometimes ingest. In assessing the health implications of exposure to such pollutants, two important questions being examined are the relative contribution of the various possible routes of exposure to observed health effects and the exposure-response relationships exhibited by these substances. Examples include population studies which were initiated in 1975 on the health impact of these metals in communities near primary smelters, and the development of screening systems for rapid assessment of potentially hazardous biochemical activity.

Terrestrial Ecology Effects Research

The Agency's ecological research activities which deal with the effects of air pollutants on land life other than man has proceeded along two broad program fronts. The primary program thrust relates directly to strengthening the scientific basis for air pollution control strategies mandated by the definition of "welfare" effects in the Clean Air Act. The second major program comprises a newly initiated effort in "energy" research to assess the terrestrial impact of a representative coal-fired power plant located at Colstrip, Montana.

Vegetation growing near a source of sulfur dioxide (SO_2) experiences continuous but varying pollutant concentrations. Very high concentrations occur infrequently but can be anticipated fairly accurately if adequate historical data are available. A more realistic research approach to determine SO_2 and photochemical oxidant effects on plant growth and crop yield has been initiated during the past year. Simulations of random variation in pollutant concentration based on published national air quality data from selected sites are applied under field conditions. Preliminary results show pronounced effects on growth response curves for selected crops. These data are being used to develop damage functions for economic loss assessments.

Vast areas of the United States receive precipitation which is consistently 10 to 100 times more acidic than the geologic average. The problem is increasing in area as well as in severity, primarily because of the impact of man's activities. Research is underway to determine the effects of acidic rain on nutrient cycling and plant-soil processes over a three-year period. Simulated rain treatments representing a range of averages (from the acid content in the northeastern United States to an average for the entire United States and, finally, a value representing a possible increase in acidity) are applied for 3 to 4 hours for three days each week. Sulfates in rain that result in the formation of sulfuric acid appear to be major contributors to the acidic reaction, so the various pH values are controlled by adding sulfuric acid. Responses being measured include nutrient leaching from plant foliage and soil, decomposition of organic matter, nitrogen fixation and nutrient uptake, and effects on productivity through foliar damage. Results from this work will provide a sounder basis for future sulfate air pollution control strategies on a regional level.

The conversion of atmospheric nitrogen to an organic form by legumes, such as alfalfa and soybeans, is an essential natural process whereby nitrogen fertilizer is added to the environment. Studies have been undertaken to determine the influence of polluted air on the nitrogen conversion properties of a legume. Alfalfa plants have been exposed to low levels of ozone and sulfur dioxide throughout the growing season. The nitrogen content of the plants was determined as a measure of the nitrogen fixation. Ozone treatment reduced the nitrogen fixation by 40 percent. The ozone concentration was less than the present National Ambient Air Quality Standard for photochemical oxidants. The presence of sulfur dioxide also significantly reduced nitrogen fixation when the median concentration exceeded 0.06 parts per million (ppm). This work indicates that natural nitrogen fixation is severely limited by atmospheric contaminants, an effect which heretofore has been unrecognized.

The measurement of air pollutant effects on plants generally has been based on visual observations of injury. However, experience has shown that these measurements are not sensitive and cannot be standardized. One technique developed to solve this problem measures plant production of stress ethylene when exposed to ambient pollutants. Although ethylene production increases when visible injury occurs, it also increases when the injury cannot be seen and thus is useful in determining injury before it is visible. The test to measure ethylene production is more sensitive that visual observation and can be used as a standardized quantitative method by all researchers

Further research is in progress to delineate mechanisms and dose-response relationships for cadmium compounds. These compounds include cadmium oxides, chlorides, sulfates, sulfides and phosphates, which are toxic to many plants and animals. The sources of these compounds include automobile exhausts, tire residues, coal-fired power plants and parent rock material from which phosphate fertilizers are produced. Cadmium is a ubiquitous element in the earth's crust with no known nutritional value. A small amount of cadmium can be extracted from most plants regardless of location; larger quantities have been found to inhibit plant growth. Results of research on the nitrogen fixation in the roots of red alder trees indicate that this vital process is inhibited by cadmium. The effect may occur directly within the nitrogen fixation system and/or through the effects on other processes within the plant.

Research is also underway on the effects of pollutant stressors on soil litter decomposition. Soil litter decomposition is a process whereby dead organic matter is mineralized for plant use. This is an essential biological process without which life on the planet would cease. Research thus far has shown that cadmium and selenium are two common polluting agents which affect the rate of soil decomposition. Preliminary studies also indicate that some decomposer organisms such as mites may be forced to migrate from their normal litter habitat when subjected to sulfur dioxide. Data indicate that ozone is capable of reducing ammonia nitrogen, thus decreasing the nitrogen pool in some forest soils, and possibly affecting tree growth. Further studies are necessary in this area.

The broad objective of the energy study on coal-fired power plants is to develop a set of guidelines which planners can use in predicting the impact of power plants on a grassland ecosystem. The study is concerned not only with the stability of ecosystem organization in relation to ambient conditions, but also with the predictability and reproducibility of changes that occur. Insight into the mechanisms of responses of ecosystem components to air pollution challenge is sought. Of special concern is the identification of subsystem functions and mechanisms that contribute to ecosystem regulation. The investigation is an effort to characterize the impact of air pollutants on a total ecosystem. Included are the investigation of the effects of coal-fired power plant emissions upon plant and animal community structure; production, consumers and decomposers; plant and animal diseases; both beneficial and harmful insects; indicators and predictors of pollution; population biology; and health of vertebrate animals. This research project is scheduled to be concluded in 1978.

International Activities

International support in air pollution is provided through three main areas: international organizations, international cooperative agreements, and international contracts and grants.

Among the international organizations collaborated with by EPA, assistance is currently being provided for the following: World Health Organization (WHO), Organization for Economic Cooperation and Development (OECD), Commission of the European Communities (CEC), Pan American Health Organization (PAHO), Pan American Medical Association (PAMA), and Economic Commission for Europe (ECE). Pollutant survey documents, air criteria and guideline documents, and annotated bibliographies prepared by EPA are provided to WHO, and one individual acts as an advisor to a Task Group reviewing element pollutants. The Chairman of the Air Management Sector Group for OECD was a staff member of the Health Effects Research Laboratory. Research personnel are continuing to provide support to CEC on standardization for epidemiological studies as well as for assisting in a collaborative study of analysis of lead, mercury and cadmium in blood and urine samples. Advice has been provided to PAHO for epidemiological studies in a UN/Mexico project in studies of carboxyhemoglobin levels and studies on heavy metals in man. Personnel are involved directly with the PAMA Section on Environmental Health Sciences, and the Secretary of the Section is an EPA employee. Preparation for presentation of a paper on "The Health and Welfare Effects of Increasing Sulfur Oxides Emissions" has been completed for a U.S.-sponsored ECE seminar on desulfurization of fuels and combustion gases.

The United States has individual international cooperative agreements with five nations: Federal Republic of Germany (FRG), Israel, Japan, Spain and the U.S.S.R. Each of these, in part, addresses health effects to some degree. Cooperation with FRG includes provisions of copies of assessment studies of air pollutants, and continued cooperation in the fields of carcinogenesis and mobile source emission studies. Health effects researchers act as consultants to Israeli scientists on their programs and are collaborating on such studies as a comparative study of asthmatic populations in the two countries and a study on "Chronic Toxicity Caused by Air Pollution and Its Effect on the Health and Productivity of Domestic and Farm Animals." Cooperation with Japan includes: estimation of environmental exposure to cadmium, evaluation of body burdens, establishment of tissue banks, study of biological half-life, study of high-exposure human populations, development of laboratory procedures and development of field methodological exposures. Consultation is also provided in a 3-year study comparing chronic illnesses in comparable executive populations in New York and Tokyo. Direct health effects are not currently being pursued under the Spanish agreement. The major health effect cooperation with the U.S.S.R. lies in the specific fields of mutagenesis, heavy metals and epidemiology.

Under International Contracts and Grants there are eleven active research projects in Health Effects, funded under Public Law 480. Three of these projects are in Egypt, one in India, five in Yugoslavia, and two in Sweden. Two projects are under study in Poland.

IV. STANDARDS SET OR UNDER CONSIDERATION PURSUANT TO TITLE II

MOTORCYCLE REGULATIONS

A Notice of Proposed Rulemaking to control emissions from new motorcycles was published in October 1975.

Motorcycles are one of many small but significant sources of emissions. The average uncontrolled motorcycle presently emits about twice as much carbon monoxide (CO) and about six times as much hydrocarbon (HC) as permitted by 1975 automobile standards, which represent an 85 percent reduction over emissions from uncontrolled automobiles. When statutory standards for automobiles are met (90 percent reduction over uncontrolled levels), uncontrolled CO emissions will be 10 times as high and HC over 20 times as high for the motorcycle as for the automobile. As automobiles account for proportionately less of the CO and HC problem, control of motorcycle emissions becomes an increasingly significant factor in the further abatement of these pollutants.

All regions of the United States that are not meeting air quality standards for CO and photochemical oxidants (O_x) will benefit in some way from these control standards since they will serve as one of many strategies to help reduce overall emissions of HC and CO and thereby improve air quality. About one-third of the U.S. population (68 million people) lives in areas which are projected to have problems meeting these air quality standards in 1985.

Interim and long-term emission standards for motorcycles designed for street use are proposed. The 1978 interim standard for HC exhaust emissions is dependent on engine displacement, requiring control to 5 grams per kilometer (g/km) for motorcycles between 50 and 170 cubic centimeters (cc) displacement. The standard increases proportionately with displacement from 5 g/km at 170 cc to 14 g/km at 750 cc and above. CO emissions are limited to 17 g/km, and nitrogen oxide (NO_x) emissions are limited to 1.2 g/km for 1978. The 1978 standards also propose a prohibition on crankcase HC emissions. These standards, if met throughout the life of the motorcycle, will decrease average motorcycle emissions of HC by 30 percent and CO emissions by 22 percent. Nitrogen oxide emissions, which are inherently quite low, will increase somewhat as HC and CO are controlled.

REVISED LIGHT DUTY TRUCK REGULATIONS

Notice of Proposed Rulemaking is expected to be published early in 1976 to enlarge the definition of the light duty truck (LDT) class to an 8500 pound gross vehicle weight limit rather than the present 6000 pound limit. It also proposes reduction in HC, CO, and NO_x emissions to reflect application of the same technology and degree of stringency that will be required of light duty vehicles (LDV) under 1978 Federal standards. The proposed regulations would be applicable to 1978 and subsequent model year light duty trucks.

The need for stricter standards has developed because, as increasingly stringent controls are placed on passenger cars, the percentage of total vehicular pollution caused by trucks increases. Air quality analyses forecast that if no further controls are placed on light duty trucks used in urban areas and if current statutory control of light duty vehicles is effected, CO and NO_x emissions from LDTs will equal LDV emissions by 1985.

INTERIM HEAVY DUTY VEHICLE EMISSION REGULATIONS

In early 1976 a Notice of Proposed Rulemaking will be published for more stringent control of gaseous exhaust emissions from heavy duty gasoline and diesel powered vehicles. A more stringent standard will also be proposed for further control of peak smoke opacity from diesel engines.

Stricter emission standards for heavy duty vehicles are necessitated by the inability of some Air Quality Control Regions to meet national ambient air quality standards without further control of HC, CO, and NO_x. Although the heavy duty vehicle population accounts for only approximately 6 percent of all registered motor vehicles, the levels of HC, CO, and NO_x that they emit are significant. It is estimated that without further controls, emissions from heavy duty vehicles by 1990 will exceed those of light duty vehicles controlled at statutory standards.

The proposed interim standards represent a significant step towards alleviating excessive heavy duty vehicle emissions. Primarily because of industry lead time requirements, the standards are projected to be effective as of the 1978 model year.

SULFURIC ACID EMISSION STANDARD

The need for control of automotive sulfuric acid emissions stems from the great increase in their production by catalyst-equipped vehicles. In addition to more restrictive California standards for HC and CO which have led to the use of catalyst systems on nearly all automobiles sold in California, many manufacturers have switched to production of catalyst-equipped vehicles outside of California because they offer fuel economy advantages. Catalyst-equipped vehicles comprise over 70 percent of 1975 model year vehicles and are expected to comprise over 85 percent of 1976 model year vehicles.

REVISED EVAPORATIVE EMISSION REGULATIONS

A Notice of Proposed Rulemaking to set more stringent standards for evaporative emissions from light duty passenger vehicles and light duty trucks was published in December 1975. The most significant change in the regulations is the new evaporative emission test procedure. The present test procedure has been found to give unrealistically low test results, thereby passing vehicles which actually grossly exceed the level intended by the present evaporative standard. The proposed standard of 2 g/test for 1979 and later model years, as measured by the new test procedure, will reduce HC emissions from light duty vehicles and light duty trucks from 1.76 g/mile to 0.15 g/mile at an estimated retail cost of only $11.00 per vehicle. For the 1978 model year only, due to lead time constraints, a 6 g/test standard is proposed. This is the same level that California was authorized to enforce for the 1978 model year.

If standards are promulgated at the proposed levels, evaporative emissions will be reduced in 1990 by 3.35×10^5 tons/year. For comparison, going from the current HC exhaust emission standard for light duty passenger vehicles to the statutory standard will result in a reduction of 800,000 tons/year.

NON-METHANE HYDROCARBON EXHAUST EMISSION STANDARDS

In 1974, an Advance Notice of Proposed Rulemaking was published for conversion of current standards for motor vehicle hydrocarbon exhaust emissions to a non-methane basis (39 FR 6904). This action was in response to a formal petition by Ford Motor Company stating that catalyst-equipped vehicles tended to have a greater proportion of methane (a non-reactive and thus non-polluting hydrocarbon) in the exhaust than current vehicles. Therefore an emission standard based on all hydrocarbons, including methane, penalized vehicles with catalysts.

At this time, the analysis of the Advance Notice of Proposed Rulemaking comments is complete and results indicate that there would be little benefit in either air quality or emission controls by requiring such a conversion. Conversion would also result in considerable cost increase. Accordingly, further work in this area has been assigned a low priority.

AIRCRAFT EMISSIONS REGULATORY ACTIONS

In 1974 EPA published Notice of Proposed Rulemaking applying to emissions from engines powering supersonic aircraft. This followed up a commitment made in the preamble to the basic EPA aircraft regulations promulgated in 1973. This preamble stated that separate standards would be published for supersonic aircraft because specialized technological constraints limit their ability to meet standards applicable to subsonic aircraft.

The regulations proposed reflect the same types of combustor design technology but make allowances for the less efficient engine cycles used for propulsion of aircraft designed for supersonic flight speeds. Public hearings were held concerning this Notice of Proposed Rulemaking in Boston, Massachusetts, on November 19, 1974, and in Los Angeles, California, on November 26, 1974.

Comments and testimony have been analyzed and final standards have been set, subject to EPA review procedures. Promulgation is currently expected by spring 1976.

V. CONTROL OF MOBILE SOURCE EMISSIONS AND RELATED RESEARCH EFFORTS

Title II of the Clean Air Act mandated at least 90 percent reductions in carbon monoxide (CO), hydrocarbons (HC), and oxides of nitrogen (NO_x) emissions from light-duty vehicles and engines and gave the Administrator authority to prescribe certain other emission standards for automobiles, trucks, and planes.

MEASURES TAKEN TO IMPLEMENT MANDATED TITLE II EMISSION STANDARDS

As a result of Title II of the Act, standards of 0.41 gram per mile (g/mi) HC, 3.4 g/mi CO and 0.4 g/mi NO_x were promulgated as the ultimate statutory standards for those pollutants.

The 1970 amendments also provided that motor vehicle manufacturers could apply for a one-year suspension of these standards. Application was made in March 1972 to suspend the HC and CO standards. After an initial denial, the U.S. Court of Appeals for the District of Columbia required EPA reconsideration and on April 11, 1973, a suspension was granted for the 1975 model year. At this time interim standards of 1.5 g/mi HC and 15 g/mi CO were established.

The Administrator also took action which resulted in emission standards applicable in California of 0.9 g/mi HC, 9.0 g/mi CO, and 2.0 g/mi NO_x for the 1975 model year. The state standards waiver provision (Clean Air Act Section 209(b)) allows California, because it was the only state to adopt emission standards prior to March 30, 1966, to set standards more strict than those of the Federal government unless the Administrator of EPA, after notice and opportunity for hearing, finds either that California has not adopted more stringent standards "to meet compelling and extraordinary conditions" or that the "standards and accompanying enforcement procedures are not consistent with section 202(a)" of the Act.

Further action was taken on July 30, 1973, when the 1976 model year statutory NO_x standard of 0.4 g/mi was suspended for one year and an interim standard of 2.0 g/mi was established.

In June 1974 the passage of the Energy Supply and Environmental Coordination Act (ESECA) provided that (1) the 1975 Federal and California interim standards would also be applicable to the 1976 model year, (2) the original statutory standards for HC and CO of 0.41 and 3.4 g/mi respectively would be applicable to the 1977 and subsequent model years, (3) the interim NO_x standard of 2.0 g/mi would be applicable to the 1977 model year, (4) the original statutory NO_x standard of 0.4 g/mi would be applicable to the 1978 and subsequent model years, and (5) any motor vehicle manufacturer could, at any time after January 1, 1975, apply for a one-year suspension of the imposition of the statutory HC and CO standards to the 1977 model year.

Suspension of the HC and CO Emission Standards for 1977 Model Year Vehicles

On March 5, 1975, the EPA Administrator granted the request of Ford Motor Company, General Motors Corporation, and Chrysler Corporation for a one-year suspension of the 1977 motor vehicle emission standards.

Although effective control technology was available, the Administrator determined that the sulfuric acid problem caused by the conversion of sulfur in gasoline to sulfuric acid was a potential risk to public health in heavily traveled areas and that this risk could be minimized by retaining 1975 interim standards and promulgating a sulfuric acid standard.

Accordingly, the Administrator imposed 1.5 g/mi HC and 15 g/mi CO as interim standards for 1977 and recommended to Congress that the Clean Air Act be amended to retain these standards through the 1979 model year.

The rationale for the suspension and the Administrator's recommendation was that interim standards could be met using catalytic converters without air pumps. It has been shown that the increased oxygen concentration in the catalytic converter, caused by air pumps, results in much higher emission levels of sulfuric acid.

Waiver of Federal Preemption of California State Motor Vehicle Pollution Control Standards

On May 20, 1975, the EPA Administrator granted a request from the State of California for a waiver of Federal preemption for 1977 California standards of 0.41 g/mi HC, 9 g/mi CO, and 1.5 g/mi NO_x. Data presented led the Administrator to a determination that compelling and extraordinary conditions persist in California and that technology and adequate lead time exist for manufacturers to meet the requested California 1977 standards. The Administrator further determined that any assessment of either the magnitude of the sulfuric acid risk or the measures needed to deal with it is a matter of California's judgment.

Current standards reflecting ESECA provisions and EPA promulgation are summarized in Table V-1.

Certification Testing

Certification of new passenger cars for compliance with Federal emission standards began with 1968 model year vehicles. The program includes testing of prototype vehicles that represent all new motor vehicles sold in the United States.

Table 9-1. EMISSION STANDARDS FOR MOTOR VEHICLE CLASSES

Motor vehicle class	1975			1977			1978		
Light duty passenger	HC	CO	NO_x	HC	CO	NO_x	HC	CO	NO_x
(Emissions expressed in grams per mile)									
National	1.5	15.0	3.1	1.5	15.0	2.0	0.41	3.4	0.4
California	0.9	9.0	2.0	0.41	9.0	1.5			
Light duty trucks	HC	CO	NO_x	HC	CO	NO_x	HC	CO	NO_x
(Emissions expressed in grams per mile)									
National	2.0	20.0	3.1	2.0	20.0	3.1			
California	0.9	17.0	2.0	0.9	17.0	2.0	0.9	17.0	2.0
Heavy duty vehicles[a]	HC + NO_x	CO	Smoke	HC + NO_x	CO	Smoke	HC + NO_x	CO	Smoke
(Emissions expressed in grams per horsepower-hour)									
National	16	40	15/20/50[b]	16	40	15/20/50[b]			
California	10	30		1[c]	25	7.5[c]			

[a] Gasoline and diesel have same standards but are tested under different procedures.

[b] Diesel only; lugging/acceleration/peak.

[c] Option available for combined HC and NO_x standard of 5 grams/brake horsepower-hour.

The manufacturer is required by EPA to submit data from two tests which evaluate vehicle conformance to Federal emission standards. First, through the Durability Fleet Test, fleets are tested at 5000 mile intervals up to 50,000 miles to determine the deterioration of the emission control system. Second, through the Emissions Fleet Test, prototype fleets are tested at 4000 miles to determine their emissions at close to the "break in" point. To check manufacturers' data, EPA requires that a vehicle being tested by the manufacturer for durability be brought to the EPA laboratory in Ann Arbor, Michigan, for confirming tests. All emission data vehicles are tested in the EPA laboratory.

During the past year, certification of most 1976 model year light duty vehicles and light duty trucks was completed and certification of 1977 models began. The certification program for the 1976 model year involved monitoring the test programs of approximately 50 manufacturers, reviewing durability data from approximately 300 vehicles and engines, and reviewing emission data from 1100 vehicles and engines. To reach this level of certification, EPA conducted approximately 2000 emission tests on 1976 light duty vehicles.

To prevent possible unauthorized and unreported maintenance practices, EPA inspectors perform checks of manufacturers' facilities and records to ensure that established test procedures are followed and investigate reports of possible violations of regulations. In-depth inspections of major manufacturers' programs are made annually.

In addition to the requirements for certification of motor vehicles and engines prior to mass production, EPA has regulations governing changes to vehicles and engines during production. Approximately 600 tests were conducted during the past calendar year to determine emission compliance of modified versions of certified vehicles.

Since the 1971 model year, emission test results have been published in the *Federal Register*. Beginning with the 1973 model year, fuel consumption during the emission test has also been determined and published in the *Federal Register* as well as in a booklet for consumer use. Fuel economy labels were posted on new cars by manufacturers participating in the EPA/FEA-sponsored fuel economy labeling program. Fuel economy for 1973 and 1974 model year vehicles was based on the cold-start city test, representative of typical city driving. A highway fuel economy test procedure was added in the 1975 model year and, to provide additional fuel economy information, a combined city-highway mileage figure is presented for 1976 model year vehicles. EPA is thus able to provide emission test results and a broad picture of fuel economy test results for consumers who are concerned with both air quality and fuel economy.

ASSESSMENT OF MOBILE SOURCE TECHNOLOGY

Motor Vehicles

The number of vehicles equipped with catalysts has continued to increase, now comprising more than 85 percent of 1976 model year vehicles. Approximately 70 percent of 1975 model year vehicles were catalyst equipped. The 49-state interim standards for the 1976 model year (excluding California) permit manufacturers to choose between catalyst and noncatalyst systems. The greater use of catalysts for the 1976 model year results from the additional fuel economy advantage they offer.

The sales-weighted fuel economy of the 1976 model year fleet is 17.8 percent better than the 1975 fleet, according to EPA test data. This represents a 26.6 percent average fuel economy improvement for 1976 over 1974 cars. This gain is well over half of the President's goal of a voluntary

40 percent fuel economy improvement by 1980. Changes in carburetion, weight reductions, improved transmissions, lower axle ratios, and electronic ignition systems should also continue to contribute to improved fuel economy within present emissions standards.

In meeting past emission standards, most manufacturers used the same basic approach of engine modification (i.e., spark retard, intake manifold preheating, and faster acting chokes) and exhaust gas recirculation. The 1976 models continue utilization of a greater variety of control approaches that began in 1975. Saab, for example, uses fuel injection and no catalyst to meet both Federal and California standards. Mazda uses a thermal reactor and Honda uses its compound vortex controlled combustion (CVCC) stratified charge engine to meet the California standards.

EPA's technical staff has analyzed extensive information provided by automobile manufacturers under the provisions of section 202(b)(4) concerning their progress toward meeting the Federal emission standards. The paragraphs which follow represent the collective judgment of EPA engineers directly responsible for the interpretation and analysis of the information.

There is doubt that manufacturers will be able to meet the 0.4 g/mi NO_x standard in 1978. The most promising technologies for meeting this standard, dual catalysts and three-way (single bed) catalysts, still have unresolved problems. The present generation of dual catalysts have shown poor durability. There are also concerns about potentially hazardous unregulated emissions that require further study before such devices are allowed to be used on a widespread basis. Several problems are associated with meeting the 0.4 NO_x standard with three-way catalysts. First, the three-way catalyst is extremely sensitive to oxygen concentrations and conventional carburetors cannot provide the control of air/fuel ratio required for their proper operation. Lead time for the production of the number of electronic fuel injection systems or other advanced fuel metering systems required of the entire auto industry is considered to be about 3 to 5 years. Second, the NO_x reducing activity of the three-way catalyst is too low to permit large cars to comply with the 0.4 g/mi NO_x standard. Third, the durability of three-way catalysts is not yet proven. Also, there may be a shift in the air/fuel ratio control as the catalyst sensor ages.

Depending on advances made beyond present system designs, it is expected that achieving 0.4 g/mi NO_x for Federal emission standards will result in a fuel economy penalty. If 1979 is the first year attainment of statutory NO_x is required the fuel economy penalty compared to 1976 levels could be as high as 15 percent. Further advances in technology would be expected to decrease penalties to approximately 5 percent in 1980, relative to 1976.

Aircraft

Studies have continued in support of the regulations which EPA has promulgated limiting the emissions of carbon monoxide, hydrocarbons, nitrogen oxides, and smoke in commercial and private aircraft. Current efforts are concentrated in the following areas: (1) improvement of the precision of the emission sampling and measurement techniques specified in the EPA regulations; (2) assessment of progress by private industry and other government agencies in development of techniques for reducing emissions from turbine-powered aircraft; (3) assessment of progress by private industry and other government agencies in development of techniques for reducing emissions from piston engine-powered general aviation aircraft; and (4) development of final standards applicable to engines that power supersonic transport aircraft.

In conducting the above programs, maximum advantage is taken of ongoing efforts by other Federal agencies active in the aircraft emission area. These are principally the National Aeronautics and Space Administration, the United States Air Force, and the Federal Aviation Administration. In addition, the Department of Transportation has completed a Climatic Impact Assessment Program, and EPA is studying its findings to ascertain whether the EPA aircraft regulations already promulgated require modification to respond to upper atmosphere problems.

ADDITIONAL ACTIVITIES IN THE MOBILE SOURCE AREA

Emission Factor Program

The Emission Factor Program is an ongoing series of studies designed to obtain current data on emissions of in-use vehicles for the use of State and local agencies, Federal air pollution officials, engine and vehicle manufacturers, and concerned citizens.

Light Duty Vehicles - The most recent study, the third in the series, consisted of exhaust emission tests of over one thousand 1966 to 1974 model year in-use light duty vehicles. As in the earlier studies, the general downward trend in HC, CO and NO_x levels continued. Comparing the results of the first three programs reveals a general tendency for HC and CO levels to increase with vehicle age and mileage, probably because older vehicles may not be maintained in accordance with manufacturers' recommendations. This third study was also the first program in which the effects of air conditioning and vehicle loading upon emissions and fuel economy were measured for in-use vehicles. Results indicated that the operation of air conditioners had an adverse effect on both fuel economy and emission levels, as did increased load weight of more than 500 pounds.

The fourth program (FY 74), in progress at this time, is the performance of tests on approximately 2000 catalyst-equipped vehicles from around the country. It will provide the first large-scale results of emission levels of catalyst-equipped vehicles in use.

Heavy Duty Vehicles - Present Federal test procedures for heavy duty vehicles (HDVs) involve emission measurements during a nine-mode test for gasoline engines and a thirteen-mode test for diesel engines using an engine dynamometer. These tests provide accurate measurement of inter-city emission levels but may not accurately represent emission levels from all pollutants in city driving. Therefore, test procedures are under development which will employ a chassis dynamometer and a driving cycle representative of truck operation in urban areas. These tests and driving cycles may form the basis for proposing new heavy duty standards and test procedures in the future.

The most recent study in this area has centered around the measurement of emissions from heavy duty trucks operated on a road course and the correlation of the results with those obtained on a chassis dynamometer. Chassis dynamometer test results using the nine-mode and thirteen-mode Federal test procedures correlated reasonably well with road course emission measurements. Results generally indicated that road test emission levels were slightly higher than those attained in the chassis dynamometer test for hydrocarbons and carbon monoxide and slightly lower for oxides of nitrogen emissions.

The results from these programs will improve the accuracy of HDV emission factor estimation and provide data for evaluation of potential improvements in certification test methods.

Auto Fuel Economy Labeling Program

In the President's Energy Message to Congress of April 18, 1973, EPA was assigned, in cooperation with the Department of Commerce and the Council on Environmental Quality, the responsibility for developing a program to inform the public of the fuel economy characteristics of new automobiles.

EPA instituted a voluntary fuel economy labeling program in 1975 and 1976, co-sponsored by the Federal Energy Administration.

Of all cars sold in the United States, 99 percent are now covered by the voluntary labeling program. Usually these cars bear a label which gives a sales-weighted average fuel economy for all cars tested by EPA which represent cars of that same manufacturer, engine size, transmission, and car line. In some cases, the label may also specify that the fuel economy results are representative of cars of the same weight and axle ratio. Each label now bears three fuel economy figures--one determined by a city driving test, one by a highway test, and a calculated composite of the two. The city fuel economy figure is derived from the EPA emission certification test and the highway fuel economy figure is derived from a special highway driving cycle test performed on all certification cars tested by EPA. The composite is calculated from a "harmonic averaging" of the two test results based on Federal Highway Administration statistics indicating that the average vehicle is driven 55 percent in city conditions and 45 percent in highway conditions.

The results of EPA tests are also used to achieve uniformity in advertising. The Federal Trade Commission issued voluntary guidelines effective October 15, 1975, suggesting that any auto advertisement making miles-per-gallon claims use EPA figures. Both highway and city figures should be given and the characteristic vehicle information (engine size, number of cylinders, fuel system, and transmission) should also be mentioned. Guidelines also suggest that advertisements mention that EPA figures are no guarantee of a specific fuel economy value under all conditions or for all drivers.

EPA has again published, in cooperation with the Federal Energy Administration, The 1976 Gas Mileage Guide for New Car Buyers, listing fuel economy results for all 1976 model year passenger cars and light trucks. Two added improvements to the 1976 guide are the separate MPG listings for all vehicles offering manual versus automatic transmissions and the listing of the mileage at which the catalytic converter should be replaced on those cars that need such replacement. The pamphlet also describes the concept of fuel economy and stresses its importance as a purchase criterion for new car buyers.

Characterization of Currently Unregulated Emissions

Studies involving unregulated pollutants from both regulated sources and fuels have continued through EPA contracts and in-house testing. In prior years the emphasis involved characterization of reactive hydrocarbons, oxygenates, polycyclic organic matter (POM), and particulate emissions. Recently, additional unregulated pollutants such as platinum, nickel compounds (nickel carbonyl), nitrogen compounds (nitrosamines) and sulfur compounds (H_2S, COS, CS_2) are being measured.

Sulfates are the only currently unregulated mobile source pollutant for which regulations are being developed. However, measurement of the full range of pollutants continues on advanced prototype vehicles sent to EPA for testing as well as on catalyst-equipped vehicles, motorcycles, diesel-powered vehicles, and aircraft.

Additional studies are continuing in an attempt to characterize unregulated emissions resulting from the presence of scavengers used with lead in leaded fuel and from manganese and other octane-boosting fuel additives.

Sulfuric Acid Emissions from Catalyst-Equipped Vehicles

During the past year increased concern over sulfuric acid emissions from catalysts has been responsible for intensive study by EPA's Office of Air and Waste Management and Office of Research and Development. Primary considerations include methods of measuring and controlling such emissions and the estimated impact of sulfuric acid emissions on air quality and public health.

EPA papers have been written reassessing the public health problems, tests have compared the levels of catalyst sulfuric acid emissions with those of non-catalyst vehicles, and public hearings have been held. These were all instrumental in the March 1975 decision to suspend the 1977 model year standards for HC and CO. The stricter 1977 standards were replaced by a continuation of 1975 interim standards for these pollutants.

Measurement has established that the sulfuric acid emissions of a non-catalyst car with a conventional internal combustion engine are approximately 0.001 gram per mile. Catalyst cars without air injection generally yield somewhat higher results, but with air injection test results have generally demonstrated much higher levels of sulfuric acid emission. It is important to note, however, that large variations in test data exist.

Because long periods of time are required to complete new studies of the risk that sulfuric acid concentrations pose to health, there remains uncertainty as to the concentrations of sulfuric acid in the atmosphere which would pose a threat to public health. However, limited test results indicated that the risk was sufficient to warrant suspension of the more stringent HC and CO standards that could only be met by the installation of air pumps. Air pumps would increase the levels of oxygen in the catalyst and result in greater emission of sulfuric acid. By retaining the national interim standards, the Administrator concluded, the potential of a sulfuric acid problem would be considerably decreased. Indications demonstrated that interim standards could be met by some non-catalyst cars and those using catalysts which would not necessitate air pumps.

The March 1975 suspension decision announced EPA's intent to establish a sulfuric acid emission standard applicable to the 1979 model year. EPA has worked closely with industry and held public meetings in relation to this goal. Intensive study of emission data, catalyst technology, and test procedures continues.

A new driving cycle closely resembling crowded freeway conditions has been developed for measuring sulfate emissions. Various techniques for reduction of sulfate emissions from catalysts such as a three-way catalyst and sulfate traps are being explored, as well as the feasibility of gas desulfurization. EPA also continues to monitor research toward achieving standards for regulated pollutants without the use of catalysts.

Alternative Automotive Fuels

EPA has initiated investigations of automotive fuel alternatives to conventional gasoline and distillate fuels from petroleum. Earlier investigations determined that methanol from coal and distillate-like fuels from coal and oil shale were the most economically feasible alternative fuels for the years 1980 to 2000. In 1974, several programs were initiated to characterize the physical and engine operational properties of methanol and gasoline-methanol blends; this work is continuing.

In 1975 a program was initiated to evaluate the potential emissions from engines using gasoline-like fuels derived from coal and oil shale. Potential emissions to be considered include trace metals, sulfur and nitrogen compounds, aldehydes, particulates, acids, polycyclic organic matter, alcohols and odors, both from the fuel itself and from its combustion products.

Low Emission Vehicle Certification Board (LEVCB)

Section 212 of the 1970 Amendments to the Clean Air Act provides for a Low Emission Vehicle Certification Board (LEVCB). The Board has the responsibility for certifying vehicles which EPA has determined to have emissions substantially lower than existing Federal standards. If certified, the vehicle qualifies for preferential purchase at up to double the market value by agencies of the Federal Government. The vehicle, to be certified, must meet all the requirements of some existing class of vehicles used in Federal service. To date no candidate vehicle submitted has accomplished this.

As the likelihood of achieving the objectives envisioned by this section's drafters is very small, the Administrator of EPA has recommended to the Subcommittee on Environmental Pollution, Committee on Public Works, U.S. Senate, that the following alternatives be considered: (1) eliminate section 212 from the Clean Air Act,or (2) substitute a less cumbersome program than that set up under section 212--perhaps one simply authorizing funds for the General Services Administration and other Federal agencies to cover the added costs of procuring electrically powered vehicles.

Federal Clean Car Incentive Program (FCCIP)

The Federal Clean Car Incentive Program was designed in 1971 to foster the development of new types of low-emission vehicles capable of meeting statutory standards. When the program began, twenty proposals were received; seven of these were accepted for more detailed study. In May 1973 the Advisory Committee on Alternative Automotive Power Systems advised EPA to phase out the FCCIP. Since that recommendation, no new candidates have been accepted. Of the seven candidates accepted for study, two vehicles entered the testing phase. The first candidate was rejected in 1974 because of unacceptable emission degradation performance and the second was rejected in May 1975 because of the failure to demonstrate compliance with FCCIP entry requirements for NO_x and fuel economy.

Research and Development on Automotive Emissions

On January 19, 1975, the President signed legislation creating the Energy Research and Development Administration (ERDA). The bill included the transfer of the research, development, and demonstration sections of the Advanced Automotive Power Systems Program (AAPS) from the Environmental Protection Agency to ERDA. Assessment, monitoring, and low emission vehicle certification activities of AAPS were retained by EPA to ensure that EPA remained abreast of technical advances in the field. The research and development function of AAPS, however, is now coordinated by ERDA.

Transportation Control Plans

Progress has been made in implementing all of the transportation control measures. For example, motor vehicle emission inspection and maintenance programs are being implemented in New Jersey, Cincinnati, Chicago, and Los Angeles, with other areas planning to begin programs this year. Five California cities as well as Portland, Oregon, and Seattle, Washington, are developing parking management plans. Several cities, such as Philadelphia, are inaugurating new bus lanes to provide better mass transit service, while other cities, such as Newark and Seattle, are instituting "parking freeze areas" to discourage the use of automobiles in center city areas. Still other cities, such as San Diego, are well advanced toward full implementation of gasoline vapor recovery regulations. In areas where employer mass transit incentive regulations are in effect, numerous large industries have submitted information describing the company's plans for reducing single occupancy auto commuter trips by their employees.

VI. STATUS OF ENFORCEMENT ACTIVITIES

STATIONARY SOURCE ENFORCEMENT

The Clean Air Act amendments of 1970 approached the task of protecting health and welfare from the effects of air pollution from stationary sources in three key sections:

- §110, State Implementation Plans (SIPs) - which provide for establishing state air pollution limitations designed to achieve health related (primary standards) and welfare related (secondary standards) air quality goals.
- §111, New Source Performance Standards (NSPS) - which require EPA to develop emission limitations for newly constructed or modified major emitters, based on best available control technology and cost; these standards are to be a major factor in the maintenance of acceptable air quality achieved under section 110. After their promulgation, states are encouraged to assume responsibility for the enforcement of these standards.
- §112, National Emission Standards for Hazardous Air Pollutants (NESHAPs) - which require EPA to develop emission limitations for especially toxic pollutants for which air quality standards cannot be adequately established. As under section 111, states may request delegation of these standards.

While the Act placed the primary responsibility for attainment and maintenance of air quality standards upon the states, EPA's enforcement authority was also greatly strengthened under the 1970 amendments. Section 114 of the Act authorizes EPA to make inspections, require reports and recordkeeping, and require sources to sample their emissions in order to verify compliance with the emission limitations established above. Section 113 of the Act authorizes EPA to actively enforce against sources violating requirements established under sections 110, 111, 112, and 114 by issuing an order to comply or by commencing civil or criminal action.

The Clean Air Act was further modified in 1974 with the addition of section 119, "Energy Related Authority," which defines EPA's role in the implementation of the Energy Supply and Environmental Coordination Act of 1974. Under section 119, the Administrator is given the responsibility for ensuring that attainment and maintenance of the ambient air quality standards is not endangered by any stationary fuel-burning source shifting from oil to coal. This is to be accomplished through specific conditions and limitations laid out in a compliance schedule for each source prohibited by the Federal Energy Administration from burning oil, and is to be enforced via the powers in sections 113, 114, and 119.

In accordance with the intent of the Act, it is EPA's policy to defer to state enforcement where effective progress is being made. EPA enforcement actions to ensure compliance with emission limitations established under the State Implementation Plan are therefore undertaken to stimulate or assist state enforcement programs, and states are encouraged to request delegations of the enforcement of NESHAPs and NSPS. Much of EPA's stationary source air enforcement program to bolster state efforts is carried out through the provision of technical and legal assistance, provision of specialized skills or expertise, special contractual efforts, and control agency grants.

The effectiveness of EPA and state enforcement efforts under each of the above sections of the Act over the past year is addressed separately below.

§110, State Implementation Plans (SIPs)

The Act established a stringent timetable for EPA and states to abate air pollution. In accordance with this schedule, EPA promulgated ambient air quality standards on April 30, 1971, for five air pollutants: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and photochemical oxidants. Under the Act, the states then had just 9 months to develop comprehensive implementation plans (which included enforceable emission limitations) designed to achieve these ambient standards, and EPA was allotted 4 months for the review and approval or disapproval of these plans. These deadlines were substantively met when EPA approved most portions of the SIPs in May 1972. With a few notable exceptions (e.g., sulfur oxide emission limitations in the State of Ohio), all states now have fully enforceable emission limitations affecting stationary sources. The Act allows 3 years from the date of state plan approval for EPA and the state to reduce pollution levels to the health-related ambient air quality standards. Except for portions of 16 states, where an extension of up to 2 years has been granted for one or more pollutants, these primary ambient air quality standards were to be met by May 31, 1975.

Of a total of 247 Air Quality Control Regions (AQCRs), however, it is currently estimated that 132 are not achieving primary standards for particulates, and 45 AQCRs are not attaining primary standards for sulfur oxides. The reasons for non-attainment differ in each AQCR, but the most common causes, each contributing in varying amounts to air pollution problems, are: non-compliance by major and minor stationary sources, deficient SIPs, and high background levels of fugitive dust. State and Federal programs have faced an immense task in achieving compliance since there are estimated to be over 200,000 stationary sources subject to SIP emission standards. Approximately 20,000 of these sources are major emitters (i.e., facilities individually capable of emitting over 100 tons of a pollutant per year) which, as a class, produce about 85 percent of all air pollution emitted by stationary sources. Accordingly, EPA and state enforcement programs have focused through 1975 on ensuring compliance by this class of emitters in order to have the greatest impact on pollution abatement. From approval of most SIPs in May 1972 until May 1973, EPA and the states had investigated only about 7,000 of these sources. By January 1975, 19,175 of these major emitters had been identified and investigated, and to date state and Federal programs have located and inspected about 19,958 facilities, nearly all of the estimated 20,000 major sources.

As reported in the last review of EPA enforcement under the Clean Air Act, only six enforcement actions had been taken against stationary sources in 1972. In 1973, the number of EPA enforcement actions increased to 112, and in 1974 EPA took 271 enforcement actions. With the addition of nearly 600 enforcement actions to date, the cumulative number of actions brought now approaches 1,000. A summary of these actions, current through June 1975, is contained in the Appendix. As shown in the Appendix, state action for many of these sources has been stimulated by EPA initiation of enforcement. The actions also represent the results of a major effort on the part of EPA to establish the compliance status of sources subject to SIP emission limitations. In 1972 only about 100 compliance investigations were made under the authority of section 114 of the Act; in 1973 the number of field actions increased to 2,000; in 1974 about 3,600 such investigations were completed; and this year EPA completed over 6,000 field investigations. This increase in enforcement activity was mirrored by the state enforcement programs, resulting in a great increase in the number of major sources brought into compliance.

Of the 19,958 identified major sources mentioned above, a total of 16,271 (82 percent) now comply with applicable emission limits or are meeting compliance schedules, an increase of almost 2,700 over the number known to comply a year ago. Of the 16,271 in compliance, 14,826 are in final compliance with all requirements, and 1,445 are meeting increments in their compliance schedules. About 6,500 major sources had yet to be identified or investigated at the beginning of 1974; as of October 1975, very few major sources are thought to remain outside state and EPA inventories, and 1,200 of the identified major sources are the targets of EPA and state investigations to complete determinations of compliance status. Some 2,480 major sources (12 percent) are known to violate emission limitations or compliance schedules at the present time; these sources are the subject of current EPA and state case development programs.

Despite this progress in SIP enforcement, several categories of major sources still pose large compliance problems, and the problems presented by large numbers of non-complying "minor" sources (i.e., those emitting under 100 tons/year of a pollutant) are just now beginning to be addressed. Although state and Federal agencies do not yet have adequate inventories of minor air pollution sources, it is estimated that about 200,000 minor sources exist that are subject to SIP emission limitations, and that a large proportion of these are contributing to failures to attain the primary standards. EPA and states are now assessing the reasons for non-attainment in each AQCR where primary standards are not being met and will in 1976 develop and begin to implement action plans based on these analyses. These action plans will establish priorities for enforcement efforts to achieve the greatest improvements in air quality as quickly as possible by identifying, on a source-by-source basis, those non-complying major and minor sources that are contributing to non-attainment problems. It is becoming evident, as more major sources are brought into compliance, that although large strides have been made in improving air quality, primary standards will not be attained until vast numbers of smaller emitters comply with emission limits. Although all the data are not yet collected and evaluated, it is likely that the analyses will identify 130,000 such sources as possible targets for enforcement attention.

Several notable categories of major polluters, however, remain under close scrutiny by states and EPA. Nationwide programs are now being carried out to bring about compliance as quickly as possible by coal-fired power plants, iron and steel manufacturing plants, and smelters.

Coal-Fired Power Plants - Control of emissions from power plants is essential to the attainment of the health-related air quality standards for sulfur oxides in many areas of the U.S. As a class, coal-fired steam electric plants emit about 60 percent of the total sulfur oxides produced by all sources. During the summer of 1973, it became increasingly apparent to EPA that progress to meet applicable State-adopted sulfur oxide emission limitations by this sector of industry was severely lagging. New supplies of low-sulfur-content coal, the favored approach to reducing sulfur oxide emissions, were becoming increasingly scarce and utilities were extremely reluctant to use flue gas desulfurization (FGD) systems (scrubbers) to remove sulfur oxides from the stack after high-sulfur-content coal has been burned. EPA held national public hearings in the fall of 1973 to review the status of power plant compliance with sulfur oxide emission limitations and to determine whether FGD offered an available control alternative to the use of cleaner fuels. On the basis of testimony by utilities, FGD vendors, and other authorities on the subject, the hearing panel concluded that the basic technological problems associated with FGD raised by the utilities had been solved or were within the scope of current engineering and that FGD could be applied at reasonable cost.

In light of these recommendations, a special enforcement program for power plants was implemented and significant progress has been made since the hearings. Approximately 400 coal-fired power plants in the U.S. (excluding Ohio) together provide about 150,000 megawatts of generating capacity. About three-quarters of these plants, representing only half of the generating capacity, are in final compliance with applicable SIP requirements. A total of 102 power plants with 73,795 megawatts of coal-fired capacity currently is not in compliance. In addition, 46 plants in Ohio with a combined generating capacity of 21,600 megawatts are not yet covered by promulgated SO_2 regulations. (Regulations have been proposed and public hearings are underway.) About 40 of these 102 plants that are not meeting final SIP emission limitations have firm plans for achieving compliance, leaving some 60 plants, totalling 45,139 megawatts of generating capacity, out of compliance and subjects of EPA enforcement actions—most of which will need substantial control (FGD or low-sulfur coal) to achieve compliance.

Another measure of the effectiveness of EPA's power plant efforts is the rise in use of FGD control devices. As of January 1976, 22 FGD installations were in operation and 20 were under construction. An additional 67 units are in various stages of planning or consideration. These 109 units represent slightly more than half of the coal-fired capacity that will need FGD systems by the end of 1980. The number of units now on-line has more than doubled -- from 13 to 27 -- and three additional systems are scheduled for startup in 1975. EPA estimates that approximately 90,000 megawatts of coal-fired generating capacity will need to install these systems by the end of 1980.

Increasingly high reliability factors (in the 80 to 90 percent range and up) are being evidenced, and several companies have purchased systems to treat sludge by-products from nonregenerable scrubber systems. In addition to the three units anticipated to be operable by the end of 1975, 11 more are expected by the end of 1976 and 20 more by the end of 1977, bringing the total number of on-line systems to 67 by the end of 1977. The rest of the units are scheduled for startup between 1978 and 1983, and some startup dates are unknown because installation is tied to the startup dates of new plants.

Although much progress has been made, full nationwide compliance by coal-fired power plants has not yet been achieved and much work remains. Sulfur oxide emissions from the remaining large power plants out of compliance continue to have a major impact on achieving the primary ambient air quality standards. Compliance by power plants therefore remains a high priority for state and Federal programs, and EPA is continuing to bring pressure on this industry to comply.

Iron and Steel Facilities. The iron and steel industry presents one of the most difficult compliance problems confronting state and Federal air pollution enforcement programs. There are nearly 200 of these installations in the United States which produce iron and steel or solely coke to be used in the metallurgical industry. Within these installations are a number of major emitting processes, each of which presents tough technological problems to control. The complex nature of the industry has also made it difficult for control agencies to establish the degree with which various processes within the facility do or do not comply with applicable air pollution laws. When iron and steel facilities are compared to all stationary installations capable of emitting more than 100 tons/year of a pollutant, it is apparent that abatement of air pollution in the steel industry is far behind that in most other stationary sources.

Table VI-1. COMPLIANCE STATUS OF MAJOR STEEL PROCESSES VS ALL MAJOR STATIONARY INSTALLATIONS

Sources	Number	Percent complying	Percent in violation	Percent unknown status
All major steel processes (8/31/75)	1,177	38	26	36
All major stationary installations (9/30/75)	19,958	82	12	6

As indicated in Table VI-1, the steel industry is characterized by less than half the degree of compliance of all other major sources, more than double the violations, and a need for a great deal of investigation of compliance status. It is important to note that in this comparison the compliance status of individual processes within steel facilities is being compared to the status of total installations with major potential air pollution problems. (The source of the stationary source compliance figures is the EPA formal reporting system for September 30, 1975; under this system a facility having several processes, only one of which is in violation or of unknown status, must be classified as in violation or unknown as a whole.) Of a total of 1,177 such processes, 857 had been identified and investigated to some extent by EPA and states by the end of August 1975. Of the 857 processes investigated, 449 (52 percent) were found to comply with emission limitations or compliance schedules, 301 (35 percent) were in violation of the emission limitations without schedules or violating schedules to achieve compliance, and 107 (13 percent) were under study by EPA and state agencies to determine their compliance status. Of the six major steel processes addressed in this summary, by-product coke batteries were most often in violation of applicable standards — reflecting a national controversy over the feasibility of controlling these types of sources.

To date, EPA has taken a total of 53 enforcement actions at 33 iron and steel facilities (32 notices of violation, 18 enforcement orders, and 3 referrals to Justice Department for civil/criminal prosecution), up from 8 such actions in 1973 and 25 actions in 1974. As a result of these actions:

- 2 installations contend they are in final compliance,
- 14 installations are meeting EPA schedules,
- 4 installations are meeting state schedules,
- 6 installations are negotiating schedules with EPA,
- 1 installation is negotiating a schedule with the state,
- 3 installations are subjects of state/EPA court actions, and
- 3 installations are involved in suits under section 307, further enforcement action stayed.

Although much remains to be accomplished in bringing steel mills and coke plants into compliance, it is anticipated that the current enforcement program will continue to yield results and that in 1976 most of the country's iron and steel mills will be subjects of EPA enforcement actions leading to firm compliance schedules.

Primary Non-Ferrous Smelters: Though small in number, the nation's 25 non-ferrous smelters account for about 10 percent of the total sulfur oxides emitted by stationary sources. Most of the Agency's problems in assuring compliance by non-ferrous smelters have centered in the western U.S., where six State Implementation Plans for sulfur dioxide affecting 13 smelters were disapproved in 1972 as inadequate to meet the National Ambient Air Quality Standards unless the smelters were controlled. Regulations have been promulgated for one smelter and proposed for three others, and will soon be proposed for the remainder. These regulations require application of reasonably available retrofit control technology and, if necessary, allow the interim use of supplementary control systems (SCS) and tall stacks until adequate constant emission control techniques become reasonably available. Each smelter using SCS is further required to conduct a research and development program to hasten the development of such technology. The one regulation that has been promulgated (in Nevada) was reviewed in the Ninth Circuit Court of Appeals on a challenge under section 307 of the Clean Air Act and was upheld by the court on November 19, 1975.

Five smelters in the eastern U.S. are now violating an approved regulation. With few exceptions, state agencies are adequately responding to the problem. In one case, EPA issued an administrative order to enforce the regulation; in another, enforcement is stayed by a challenge to the SIP under section 307; and one smelter ceased operations in May 1975, pursuant to a state order.

About half of the primary non-ferrous smelters are located in AQCRs where statutory attainment dates have been extended to July 1977. No major obstacles are anticipated that might prevent achievement of primary ambient standards in the vicinity of these sources by the mid-1977 deadlines by using SCS; however, installation of some constant control devices may not be completed before the attainment date. Those subject to mid-1975 deadlines are, for the most part, now nearing compliance.

Summary. In summary, significant progress is being made in the enforcement of SIP emission standards. Most national average concentrations for the five criteria pollutants show a general, but distinct, downward trend from the 1960's into the 1970's, especially in those areas having the worst pollution problems. However, much remains to be accomplished in the next several years as enforcement efforts are concentrated on the remaining major hard-core polluters and on the vast number of minor polluters across the country. While the health-related air quality goals have not yet been attained in many areas, the progress being made in enforcement of SIPs will ensure attainment as quickly as possible.

VIII. New Source Performance Standards (NSPS)

New source performance standards (NSPS) were first promulgated on December 23, 1971, for five categories of major emitters (steam electric power plants, municipal incinerators, nitric and sulfuric acid plants, and Portland cement plants). A second group of NSPS covering an additional 7 source categories was promulgated on March 8, 1974. NSPS for five categories of the phosphate fertilizer industry were promulgated on August 6, 1975, and NSPS for electric arc furnaces were promulgated on September 23, 1975. NSPS for six other categories have been proposed and should be promulgated very soon. As of October 1977, 246 sources have been found subject to promulgated provisions, and compliance levels of 89 percent have been achieved.

Because these are primarily standards for new sources, relatively little enforcement activity has developed to date from their promulgation. However, sources starting up in 1978 are expected to result in a great increase in enforcement. The importance of these standards as a means of maintaining the improving air quality will also increase in years to come.

§112, National Emission Standards for Hazardous Air Pollutants (NESHAPs)

On April 6, 1973, EPA promulgated regulations limiting emissions from certain sources of three air pollutants deemed hazardous to human health under the Clean Air Act provisions establishing National Emission Standards for Hazardous Air Pollutants (NESHAPs). The pollutants were asbestos, beryllium, and mercury, and the regulations required that certain categories of sources of these pollutants be brought into compliance within 90 days, be shut down, or be placed on EPA-approved schedules bringing them into compliance by April 1975. EPA determined that only 622 of 13,000 potential sources were actually covered by the regulations, and has to date brought 95 percent of these sources into compliance.

NESHAPs provisions also cover two stationary, but temporary, sources of asbestos: spraying of asbestos insulation and demolition of asbestos-containing buildings. EPA estimates that at least 30,000 spraying and demolition operations occur each year. Because of the transitory nature of these sources, enforcement at the federal level is difficult; the controls can best be imposed at the state and local levels. Therefore, EPA is making every effort to delegate responsibility for these efforts to the states.

§119, Energy-Related Authority

The Energy Supply and Environmental Coordination Act (ESECA) of 1974 was enacted to maximize scarce-fuel savings, consistent with existing commitments to protect and improve the environment. Under ESECA, the Federal Energy Administration is empowered to prohibit the use of petroleum products and natural gas at power plants and other major fuel-burning installations in order to further the primary goal of fuel savings. In recognition of the increase in emissions which will result from conversions to coal, EPA is provided an integral role in the ESECA process to ensure that primary standards are not exceeded while the FEA prohibition order is in effect and to ensure expeditious compliance with applicable SIP requirements. By December 1975, 74 generating units at 32 power plants had been issued prohibition orders, and EPA is now completing requisite analyses and drafting Federal Register proposals in order to certify to FEA the date on which FEA's orders become effective.

MOBILE SOURCE ENFORCEMENT

The mobile source enforcement program is directed primarily toward achieving compliance with vehicle emission standards and fuel regulations promulgated by EPA under provisions of the Clean Air Act. Activities of the program include preventing introduction of uncertified new domestic and imported vehicles into commerce; auditing certification procedures of domestic and foreign automobile manufacturers; enforcing vehicle assembly line emission test activity and the recall, warranty, and tampering provisions of the Act; developing and enforcing federal regulations on the availability of regulated fuels; and ensuring compliance with mobile source aspects of the State Implementation Plans.

Certification and Surveillance Procedures

Inspection/Investigation Programs. -- Under section 206(c) of the Clean Air Act, EPA is entrusted with enforcement of requirements for "new" motor vehicles or engines -- i.e., motor vehicles or engines which have not yet been sold to the ultimate purchaser.

Since January 1, 1975, mobile source enforcement personnel have conducted 56 inspections of domestic and foreign motor vehicle manufacturers. Such inspections include detailed audits of procedures and records, and visual inspection of facilities and vehicles in order to determine whether manufacturers are and have been acting in compliance with the Clean Air Act and its regulations.

A total of eight vehicle manufacturer investigations have also been conducted since January 1, 1975; some of these arose from the inspections. These investigations consist of a search of vehicle manufacturer records and documents and interrogation of individuals to determine whether violations of the Clean Air Act and its regulations have occurred. Issuance of orders for production of information pursuant to section 208 of the Act frequently accompany such investigations, and such orders have recently been expanded to include requiring the manufacturer to develop emission test data where technical violations may be accompanied by effects on emission performance. Since January 1, 1975, five section 208 letters have been issued.

Out of the eight investigations, one case was referred to the Department of Justice for enforcement action. That referral dealt with Chrysler Corporation's introduction into commerce of several hundred vehicles with incorrect emission components. Settlement negotiation is presently in progress among EPA, Chrysler and Justice. However, litigation remains an alternative.

Selective Enforcement Audit Program - A new part of the EPA Mobile Source Enforcement program concerns the development of an assembly line test program. Called the Selective Enforcement Audit (SEA) program, this involves the testing -- pursuant to an administrative order and in accordance with the Federal Test Procedure -- of a statistically representative sample of production vehicles from a specified configuration. If non-conformity is established, EPA may revoke the certificate of conformity.

In December 1974, EPA proposed regulations concerning the implementation of the Selective Enforcement Audit program and conducted a public hearing on the proposed regulations in July.

Provisions for In-Use Motor Vehicles

Anti-Tampering Program - Section 203(a)(3) makes it a prohibited act for any manufacturer or dealer knowingly to remove or render inoperative a vehicle's emission control system after sale of the vehicle to the ultimate purchaser. Since January 1, 1975, approximately 15 investigations have been conducted. Further, the Regional Offices responded to many alleged violations of the tampering prohibition during the same period. Three cases were referred to the Department of Justice for action. Since January 1, 1975, four tampering cases have been successfully prosecuted, resulting in civil penalties totaling $4,950.

Recall Program - Section 207(c) of the Clean Air Act authorizes EPA to order recall of vehicles if they do not conform to emission standards.

Approximately 185,768 vehicles have been voluntarily recalled by manufacturers for correction of emission-related problems. EPA is monitoring these recalls in addition to two recall campaigns begun in 1974 involving approximately 1 million vehicles.

Since January 1975, EPA has conducted 22 investigations of possible recalls and is currently conducting investigations involving General Motors, Ford, Chrysler, AMC, Volvo, Toyota, and Volkswagen of America for possible recalls.

Warranties and Aftermarket Parts Program - The warranty provisions of the Clean Air Act are designed to help assure that manufacturers develop and produce vehicles that meet emission standards throughout their useful lives. The production warranty provision in section 207(a) of the Clean Air Act requires that the manufacturers warrant that the vehicle or engine meets applicable emission standards at the time of sale, and is free from defects which, during the useful life, may cause the vehicle or engine to fail to comply with the emission standards. Although this provision has been in effect since the 1972 model year, it has proved of little utility to consumers experiencing difficulties with their vehicle's emission control system. The Agency believes that this is because consumers do not know with any precision what components and failures are covered by the section 207(a) warranty and, when they do make claims, are unable to sustain the burden of establishing that the failure is indeed a defect causing the emissions to exceed Federal standards, as section 207(a) is generally interpreted to require. To overcome these difficulties and to make section 207(a) useful to consumers with legitimate claims, the Agency intends ultimately to promulgate regulations defining the coverage of this provision. Major activities since January 1, 1975, in support of this long-range goal include the development of an advance notice of proposed rulemaking. To provide technical support for this program, the relationship of defective vehicle components to emissions is being investigated under contract. EPA also continued to review owners' manuals to see that the section 207(a) warranty is provided to consumers in language which adequately reflects the statutory intent.

The performance warranty provision in section 207(b) of the Clean Air Act, when implemented, will require that a manufacturer warrant that properly maintained and used vehicles and engines comply throughout their useful lives with emission standards when in actual use. This provision has not been implemented because of the technical difficulty of identifying relatively quick and inexpensive emission tests which "are reasonably capable of being correlated" with the sophisticated test used on prototype vehicles, as section 207(b) requires. Major enforcement activities in this area since January 1, 1975, include the continued analysis of correlation data to attempt to identify correlatable short tests and the response to a Congressional report recommending that section 207(b) be substantially repealed. This response was provided to the House Small Business Subcommittee on June 26, 1975, and reiterated EPA's general support for section 207(b) as it is presently written.

In support of the warranty programs, and to protect against any possible anti-competitive effects in the automobile aftermarket, EPA has endorsed an industry-led voluntary self-certification program for certain automotive aftermarket parts. The potential anti-competitive problems were the reason for the House Report recommending substantial repeal of section 207(b), discussed above. Major efforts in this area since January 1, 1975, include continued supervision of the industry's efforts to develop performance standards for emission-related parts; an Agency report summarizing the comments on the Federal Register Notice of November 14, 1974, outlining the self-certification program; and the letting of a contract intended to investigate the relationship between parts and vehicle emissions.

Imports Program - Sections 203(a)(1) and 203(b)(2) give EPA responsibility for enforcing compliance of imported motor vehicles with emission standards. In conjunction with the Bureau of Customs, EPA has monitored importation of an estimated 2 million commercial and privately owned vehicles since January 1, 1975. Through that program, 259 noncomplying vehicles imported under bond have been modified pursuant to administrative orders. In addition, 71 nonconforming vehicles have been exported pursuant to administrative orders. A total of 173 bond forfeitures have been assessed through Customs for noncompliance with the regulations.

EPA has conducted 26 investigations of alleged illegal importations. Two cases were referred to Justice Department for prosecution.

Fuels Enforcement Program - EPA has responsibility for enforcing section 211(c)(1) of the Clean Air Act relating to the regulation of fuels and fuel additives. On January 10, 1973, EPA promulgated regulations requiring the general availability of unleaded gasoline by July 1, 1974, for use in 1975 and later model cars equipped with catalytic emission control systems.

EPA has established a nationwide Fuels Enforcement Program for ensuring that affected retail outlets are in compliance with these regulations. This program entails sampling of the fuel at retail outlets by Regional EPA Field Inspectors, through the use of a mobile van test facility.

From January 1 of this year, EPA has conducted approximately 18,500 inspections of service stations to ensure compliance with the unleaded fuel regulations. Approximately 15,000 gasoline samples were taken, of which about 160 were found to be contaminated with lead. Approximately 6900 minor violations were also found during this period. Because many of the stations contained multiple violations, the number of stations out of compliance is estimated at 3000. Enforcement has issued approximately 3500 warnings and 260 complaints, and has collected close to $31,000 in penalties during this period.

Generally, warnings are issued for minor violations, and penalties are assessed for contamination, deliberate violations, repeated violations, and failure to respond to warnings. The warning generally allows the violator to come into compliance in a reasonable time. When a contamination is found, a complaint is usually issued against both the retailer and his supplier, with each given an opportunity to show that he is not responsible.

Inspection/Maintenance and Transportation Control Plans

During the past year, EPA has taken efforts to assure the implementation of state Inspection/Maintenance programs. Establishment of these programs will reduce emissions from vehicles in use and will help assure that National Ambient Air Quality Standards for carbon monoxide and photochemical oxidants are achieved in certain Air Quality Control Regions. During the past year, EPA has issued eight notices of violation under section 113 for failing to implement Inspection/Maintenance programs. Two enforcement orders under section 113 of the Clean Air Act were issued to New York and Chicago.

In relation to Transportation Control Measures, EPA has issued two Notices of Violation and two section 113 orders to Chicago, 13 notices of violation and seven section 113 orders to the City of New York, and 90 Notices of Violation to employers in New Jersey for failure to implement employer carpool control measures.

While Title I gives EPA the authority to ensure enforcement of Transportation Control Plans, recent Circuit Court decisions relating to enforcement of Transportation Control Plans and Inspection/Maintenance have taken opposing views on the issue of whether EPA has the authority to take enforcement actions directed at governmental bodies. The courts have, however, unanimously upheld EPA's authority to take enforcement actions against individual sources.

COMPLIANCE BY FEDERAL FACILITIES

EPA's policy on Federal facilities, as expressed in Executive Order 11752 (December 17, 1973), is based on the belief that Federal facilities should provide leadership in the prevention, control, and abatement of pollution by complying with substantive standards and limitations of Federal, State, and local laws, just as any person must comply with such standards and limitations. To help facilitate compliance, certain responsibilities of the Administrator and the heads of Federal agencies were established by the Executive Order. The Administrator has three main duties with regard to coordination and cooperation between Federal agencies and State and local pollution control agencies:

1. Issue regulations and guidelines to expedite compliance.
2. Provide liaison to coordinate Federal agency action with State and local programs for pollution control.

3. Mediate conflicts between Federal agencies and State and local agencies in matters of compliance.

The heads of Federal agencies also have three main duties to assure cooperation with the Administrator and State and local agencies:

1. Comply with the regulations and guidelines issued by the Administrator.
2. Provide information to the Administrator and cooperate with the State and local agencies to help determine compliance with applicable standards.
3. Consult, when appropriate, with the Administrator and State and local agencies concerning the best techniques for solving pollution problems.

Although the Executive Order clearly expresses the policy that Federal facilities are required to comply with substantive standards and limitations, it also states that it is *not* the policy of the Executive Branch to require Federal facilities to comply with State and local administrative procedures with respect to pollution control. This distinction between substantive standards and procedural requirements is the main issue in two conflicting court cases - *Kentucky* v. *Ruckelshaus* in the Sixth Circuit Court of Appeals, and *Alabama* v. *Seeber* in the Fifth Circuit. In the earlier case, *Kentucky* v. *Ruckelshaus*, the court held that Federal facilities were not compelled to apply for State operating permits, as such permits were considered procedural rather than substantive requirements. In so holding, the court reasoned that subjection of Federal facilities to State and local permit requirements was *not* intended by Congress in its plan to prevent and control air pollution.

The Fifth Circuit Court of Appeals in *Alabama* v. *Seeber*, however, reached a contrary decision. In that case the Court relied on section 118 of the Clean Air Act to conclude that Congress did intend that Federal facilities be required to obtain State permits by quoting language that such facilities are subject to the same State requirements as any person. The substantive/procedural distinction that was upheld in the *Kentucky* case was rejected in this case, despite the existence of Executive Order 11752, which, according to the Court, cannot modify the Clean Air Act.

Contrary to the *Seeber* case it remains the position of EPA to continue to follow the policy guidance of Executive Order 11752, and the opinion in the *Kentucky v. Ruckelshaus* case. Since the parties in that case have appealed to the Supreme Court, it is highly probable, especially in the face of two conflicting Circuit Court decisions, that the case will be heard soon.

Compliance through Federal Procurement Activities

Legal Authority and Background: Section 306, "Federal Procurement," was designed to utilize the federal contract, grant and loan processes as a means of encouraging compliance with the Clean Air Act. Section 306(a) prohibits any Federal agency from contracting to perform at any facility giving rise to a criminal conviction under section 113 of the Act. Section 306(c) empowers the President to issue an Executive Order requiring each Federal Agency to use the contract, grant, and loan processes to implement these provisions of the Act and to set forth procedures, sanctions, penalties, and such other provisions as the President determines necessary to carry out the section. Section 306(d) empowers the President to exempt any contract, loan or grant from the provisions of the section on the basis of paramount national interest. This section is comparable to the language of section 508 of the Federal Water Pollution Control Act of 1972, as amended (33 U.S.C. 1251 *et seq*).

Executive Order 11602, issued under the Clean Air Act to implement section 306, was superseded by Executive Order 11738, issued on September 10, 1973. The Order used the same language as E.O. 11602 but made its provisions applicable to both the Air and Water Acts.

Section 5 of Executive Order 11738 requires the Administrator of EPA to issue implementing rules and regulations. Regulations implementing the air requirements were promulgated in the Federal Register on December 27, 1973 (40 CFR Part 15, 38 FR 35320). On April 16, 1975, EPA promulgated regulations to revise the previously promulgated air regulations and to incorporate appropriate provisions of sections 306 and 508 and Executive Order 11738. These regulations essentially repeat the requirements of the December 27, 1973, air regulations but make them applicable to both the Air and Water Acts. The regulations provide for the establishment of a List of Violating Facilities which will show those facilities ineligible for use in a Federal contract, grant or loan.

The most controversial issue surrounding the regulations concerned whether EPA had the legal authority to go beyond a Federal criminal conviction as a potential basis for listing a facility. Pursuant to section 306(c) of the Clean Air Act and sections 1, 4, 5, and 7 of the Executive Order, EPA has such authority. Section 306(c) is independent of section 306(a) in that it vests broad authority in the President to set forth "procedures, sanctions, penalties, and other provisions. . . ." to carry out the purposes of the section. Section 306(a) refers only to one, "non-discretionary" basis for listing, i.e., Federal-criminal conviction, and pertains only to Government contracts. The Executive Order supports this interpretation. Section 1 defines the broad purposes of Section 306, i.e., "to assure that each Federal agency . . . shall undertake procurement and assistance activities in a manner that will result in effective enforcement of the Air (and Water) Acts." Section 5 directs the EPA Administrator "to issue rules and regulations as he deems necessary and appropriate to carry out the purposes of the Order." Section 7 vests futher discretion in the Administrator to take "appropriate action" in cases of noncompliance. Thus, EPA's reliance on section 306(c) of the Act and section 5 of the Executive Order in issuing its regulations indicates that the Administrator has exercised his discretion in going beyond the one "mandatory" basis for listing (Federal criminal conviction) in order to meet the goals of the Act.

Description of Program--The program established in the regulations published on April 16, 1975, effects contract, grant and loan activities of all Federal agencies as of July 1, 1975. It is facility-oriented, not company-oriented, so that only the specific facilities placed on the EPA list will be ineligible for use in a Federal contract, grant, or loan. Facilities will be listed upon a determination by EPA of continuing or recurring noncompliance with clean air (or water) standards. However, Federal criminal convictions require an automatic listing. When Federal criminal conviction is the basis for listing, removal will not occur until the Administrator certifies that the condition which gave rise to the conviction has been completely corrected. State and local criminal convictions and Federal, state, or local civil adjudications or administrative findings that such facility is in noncompliance with clean air (or water) standards also may serve as a basis for listing. In those cases removal from the list will not occur until EPA enters into an approved plan of compliance which will ensure that the condition which gave rise to the listing will be corrected. In cases where a facility has been subject to state or local civil adjudications or administrative findings, EPA shall only consider listing at the request of the Governor.

The program will apply to any contract, subcontract, grant, subgrant, loan, or subloan in excess of $100,000 as well as to any contract of a lesser amount involving a facility listed on the basis of a Federal criminal conviction.

In order to ensure due process, no facility will be listed until its representatives have been afforded an opportunity to confer and present information to the Director, Office of Federal Activities, EPA (this is called a Listing Proceeding). If, in turn, a request to be removed from the list is denied, representatives of the facility will be afforded a hearing before an EPA hearing officer with fair opportunity to present evidence and to cross-examine.

It must be emphasized that the program is an additional arm of the EPA enforcement effort and is primarily designed to encourage voluntary compliance and not to penalize a facility.

Implementation Within the Federal Establishment. Pursuant to section 4 of the Executive Order, each Agency of the Executive Branch is obligated to implement the listing program through its contract, grant, and loan activities. Implementation involves amending the Federal Procurement Regulations (FPR), the Armed Services Procurement Regulations (ASPR), and any supplemental or comparable regulations as well as close coordination with EPA to ensure that requirements of the program are fully carried out. The ASPR, FPR (which guides civilian agencies), and NASA and ERDA procurement regulations have been amended. Also, agency grant and loan provisions have been amended.

EPA will publish the List of Violating Facilities periodically in the *Federal Register*. In addition, contact points within each Federal agency have been identified to receive EPA's List of Violating Facilities every time a new facility is added to ensure prompt implementation.

Under the contract provisions each bidder must certify when bidding on a particular contract that he is not on EPA's List of Violating Facilities and that he will promptly notify the contract officer of the receipt of any communication that he is under consideration for listing. If a particular basis for listing has been identified against a facility but the facility is not on the EPA list, the Director, Office of Federal Activities, EPA, may request that an award of a particular contract be withheld for a period not exceeding 15 days pending completion of an investigation.

It is also required that contractual provisions be inserted in every non-exempt Federal contract. The contractor must agree that no portion of the work will be performed at a facility on the EPA list; that he will comply with the clean air (and water) standards issued prior to the contract award and the requirements of records and inspection under the Air and Water Acts; that he will use his best efforts to comply with clean air (and water) standards where the facility has not been listed prior to award; and that the contractor will insert these same requirements in any non-exempt subcontract. This last provision illustrates the reach of the program to cover all sub-contractors.

These same requirements have been inserted in agency regulations covering grants and loans.

It is emphasized that the awarding agency must determine whether the solicitation and contract provisions are being followed and that each agency can assist in the effectiveness of the program by encouraging contractors to comply with clean air (and water) standards. Also, the head of each agency has a responsibility to ensure that all officers and employees of his agency involved in the contract, grant, or loan process be familiar with the regulations. To further assist EPA in implementaton, the head of each agency has responsibility to promptly report to EPA any condition in a facility which may involve noncompliance with air (or water) standards.

SUMMARY OF LITIGATION IN 1975

Transportation Control Plans

By far the largest legal issue arising out of the extensive litigation concerning transportation control plans has concerned the extent to which, under the Clean Air Act and the Constitution, EPA may require states to implement programs to reduce pollution from private vehicles using public roads.

One court has sustained EPA in full on this issue, reasoning that any other approach would be impractical and that the states may Constitutionally be regulated when they engage in activities affecting commerce.[1] Two others have taken a different position, holding that an attempt to make a state administer and enforce programs to control pollution by its citizens is not authorized by the Act and may be unconstitutional.[2] Finally, a fourth case has held that EPA may compel states to implement any of their programs closely related to the actual operation of the state-owned roads in a manner consistent with any transportation control measure EPA promulgated.[3] With the circuits in disagreement on the interpretation of the Clean Air Act as it pertains to EPA's authority, EPA has requested the Solicitor General to appeal the last three decisions to the Supreme Court.

Lead Additives in Gasoline

Petitions for review were filed by Ethyl Corporation and other companies challenging EPA's regulations providing for a 65 percent reduction in the use of lead additives in gasoline by 1979 on the ground that lead emissions from motor vehicles endanger public health. On December 20, 1974, a panel of the District of Columbia Court of Appeals set aside the regulations in a 2-1 decision holding that EPA had misconstrued the "endangerment" test of section 211 of the Clean Air Act and that the evidence did not show a hazard to health. On March 17, 1975, the full Court voted 6-3 to grant EPA's petition for rehearing _en banc_ and vacated the original panel decision. The case was reargued on May 30, 1975.[4]

New Source Performance Standards

The first final decision of any of EPA's new source performance standards promulgated under section 111 of the Clean Air Act was issued in 1975. That decision[5] upheld EPA's standards for Portland cement kilns and the economic and technical analysis supporting these standards. In mid-December the Supreme Court refused to review the lower court's decision. Thus, EPA's basic approach to new source performance standards has been approved.

Variances

In the only Supreme Court decision to interpret the Clean Air Act, the Court held that state-issued variances may be treated by EPA as SIP revisions and do not have to satisfy the rigorous requirements of section 110(f) unless the variance adversely impacts attainment or maintenance of ambient air quality standards. In addition to upholding the Agency's position on variances, the decision is significant because of its extensive discussion of other Clean Air Act matters.[6]

Review of SIPs

Several circuit courts decided cases involving the question whether EPA must, as a prerequisite to approval of an SIP or revision thereof, determine that it is economically and technologically feasible. Two of these cases were decided by the Third Circuit.[7] In both cases, the Court reiterated its original position that feasibility issues had to be addressed at the time of plan approval.[8] Moreover, this court held that in the course of such review EPA must, among other things, assess the impact of the plan on the profitability of the companies challenging the plan and, should the Agency determine that a plan is infeasible, it must disapprove it. EPA has petitioned for Supreme Court review of both cases (St. Joe Minerals vs EPA and Duquesne Light Company vs EPA), and has asked that the court defer consideration of these cases pending a decision by the court in the Union Electric case.[9]

The remaining courts to address the feasibility review issue arrived at decisions contrary to Third Circuit. One held that challenge to the feasibility of a plan may be raised at the state level during the development of a plan or in Federal (or state) court at the time the plan is being enforced, but not in Federal court at the time the plan is being approved.[10] Another court ruled that EPA cannot consider anything other than the eight requirements of section 110(a)(2) of the Act at the time it approves a plan.[9] A third decision stated that disputes involving technical infeasibility are to be resolved at the State level.[11]

Dispersion Technology vs Constant Controls

In a significant decision, the Sixth Circuit aligned itself with the Fifth Circuit[12] and, citing Train vs NRDC et al., supra, for authority, held that dispersion technology such as tall stacks or intermittent controls may not be utilized to meet emission limitations unless constant controls such as scrubbers are demonstrated to be unavailable.[13] A similar decision was recently reached by the Ninth Circuit.[14]

Enforcement

In a recent decision, the Third Circuit has held that grand jury proceedings convened by the Federal government to investigate possible criminal violations of the Clean Air Act may not be interrupted solely because the source in question is challenging the feasibility of the subject regulations in a civil contempt proceeding at the state court level.[15] This case tends to confirm statements in prior court decisions indicating that state and Federal enforcement actions may be simultaneously brought against a polluter.

REFERENCES

1. *Pennsylvania vs EPA*, 500 F.2d. 246 (3d. Cir. 1974).
2. *Brown vs EPA*, 9th. Cir. No. 73-3306 (decided August 15, 1975); *State of Maryland vs EPA*, 4th Cir. No. 74-1007 (decided September 19, 1975).
3. *District of Columbia vs Train*, D.C. Cir. No. 74-1013 (decided October 28, 1975).
4. *Ethyl Corporation vs EPA*, No. 73-2205 and related cases (D.C. Cir., vacated December 8, 1975) reargued May 30, 1975.
5. *Portland Cement Association vs EPA*, 513 F.2d 506 (D.C. Cir. 1975).
6. *NRDC vs Train*, 421 U.S. 60 (1975).
7. *St. Joe Minerals vs EPA*, 508 F.2d 743 (CA 3, 1975) and *Duquesne Light Company et al.*, No. 73-1542 (opinion issued August 21, 1975).
8. *Duquesne Light Company et al. vs EPA*, 481 F.2d 1 (CA 3, 1973).
9. *Union Electric Company vs. EPA*, 515 F.2d 206 (CA 8, 1975); petition for certiorari granted October 6, 1975.
10. *Indiana & Michigan Electric Company et al. vs EPA*, 509 F.2d 839 (CA 7, 1975).
11. *Buckeye Power Company et al. vs EPA*, No. 73-1513 (CA 6 opinion issued October 24, 1975) (relying on *Train vs NRDC supra*).
12. *NRDC et al. vs EPA*, 489 F.2d 390 (CA 5, 1974).

13. Big Rivers et al. vs EPA and TVA vs EPA; 8 ERC 1092, Nos. 74-2015 and 74-2070 (opinion issued September 4, 1975).

14. Kennecott Copper Corp. vs Train, No. 75-1335 (CA 9, opinion issued November 26, 1975).

15. In Re: Grand Jury Proceedings, Nos. 75-1480 and 75-1456 (CA 3, opinion issued September 9, 1975).

VII. STATUS OF AIR MONITORING AND TRENDS IN AIR QUALITY

The state air pollution control agencies have been delegated the responsibility to install adequate air monitoring networks for criteria pollutants (those pollutants for which ambient air quality standards have been set) as part of the State Implementation Plan (SIP) process. EPA bases its assessments of national air quality to a major extent on the data submitted from these networks. The states submit their data to EPA's data storage and retrieval system. Summaries are then compiled of both the status of air quality with respect to Federal standards and the current scope of the composite national monitoring effort. In addition, companion computer files of data on point source and area emissions, plus meteorological data, afford researchers within EPA and outside a sophisticated tool for investigating these complex influences on air quality.

Before the formal status of compliance with a standard can be determined for an Air Quality Control Region (AQCR), a reasonable history of data (at least one year) must be compiled from a representative network of monitors. A single station reporting a second high value over the short-term standard is sufficient to document a violation of that standard; similarly, a single station reporting an annual average of values that exceeds the annual standard is enough to document a violation of that standard. Compliance must usually be demonstrated by more extensive evidence from a multi-station network. The target date for completing these networks was, in most cases, July 1974. Table VII-1 summarizes the progress made by the states through 1974 in completing the networks proposed in their SIPs. The number of AQCRs reporting violations of standards is summarized in Table VII-2. (This number of AQCRs reporting violations is different from the number of AQCRs listed in Chapter II as being unlikely to attain standards by the statutory date because the assessment in Chapter II is based on a number of factors, only one of which is air quality data.)

The diagrams in Figures VII-1 through VII-7 portray the distribution of the AQCRs above and below each of the standards. These analyses are based on data from the station(s) in each AQCR that report the highest second maximum daily value or highest annual mean. Information on nitrogen dioxide networks is not included in these tables and figures because the Federal reference method has been rescinded, and NO_2 monitoring cannot be required until a new method is designated.

If a comparison were to be made with similar tables and figures in last year's report (*Progress in the Prevention and Control of Air Pollution in 1974: Report to Congress*), it would appear that the number of AQCRs violating standards for each pollutant has increased this year. However, these AQCR totals are not yet a reliable measure of changes in air quality because the coverage of monitoring networks is still expanding and improving. More stations reported data in 1974 than in 1973 (see Table VII-2); still more can be expected when the 1975 summaries are complete. It can also be expected that some of these additional stations may reveal additional violations in areas not previously monitored.

Table VII-1. NATIONAL SUMMARY OF AIR MONITORING STATIONS REPORTING 1974 DATA TO THE NATIONAL AEROMETRIC DATA BANK BY SEPTEMBER 1975

Air monitoring stations	TSP	SO_2	CO	Ox
No. proposed for 1974[a]	3,810	2,142	467	458
No. reporting minimum data[b]	3,700	2,241	377	343
No. reporting valid annual data[c]	2,004	1,030	-	-

[a] Number of stations proposed by states in their SIPs to be operating in 1974.

[b] At least three 24-hour values for intermittent monitors or 400 hourly values for continuous monitors.

[c] Four consecutive quarters (a calendar year) of statistically valid data.

Table VII-2. NATIONAL SUMMARY OF 1974 AQCR ATTAINMENT STATUS BY POLLUTANT, AS REPORTED TO THE NATIONAL AEROMETRIC DATA BANK

Air Quality Control Regions (AQCRs)[a]	TSP	SO_2	CO	O_x
No. reporting minimal data[b]	233	210	92	86
No. exceeding 24-hour primary standard[c]	99	22	--	--
No. exceeding annual primary standard[c]	111	11	--	--
No. exceeding 1-hour standard[c]	--	--	13	75
No. exceeding 8-hour standard[c]	--	--	58	--

[a] Total number of AQCRs = 247.

[b] At least three 24-hour values for intermittent monitors or 400 hourly values for continuous monitors.

[c] An AQCR must have all reported stations showing no violations to be considered an "attainment AQCR." If a single station in an AQCR reports a violation, the entire AQCR is considered a "non-attainment AQCR."

Table VII-3. GROWTH IN NUMBER OF MONITORING INSTRUMENTS,[a] 1970-1974

Year	Particulate	SO_2	CO	O_x
1970	1283	403	73	51
1971	2044	780	133	82
1972	2875	1311	191	162
1973	3702	2008	289	265
1974	3788	2241	377	343

[a] Based on stations reporting at least minimal data to EPA; some are not yet reporting comprehensive data.

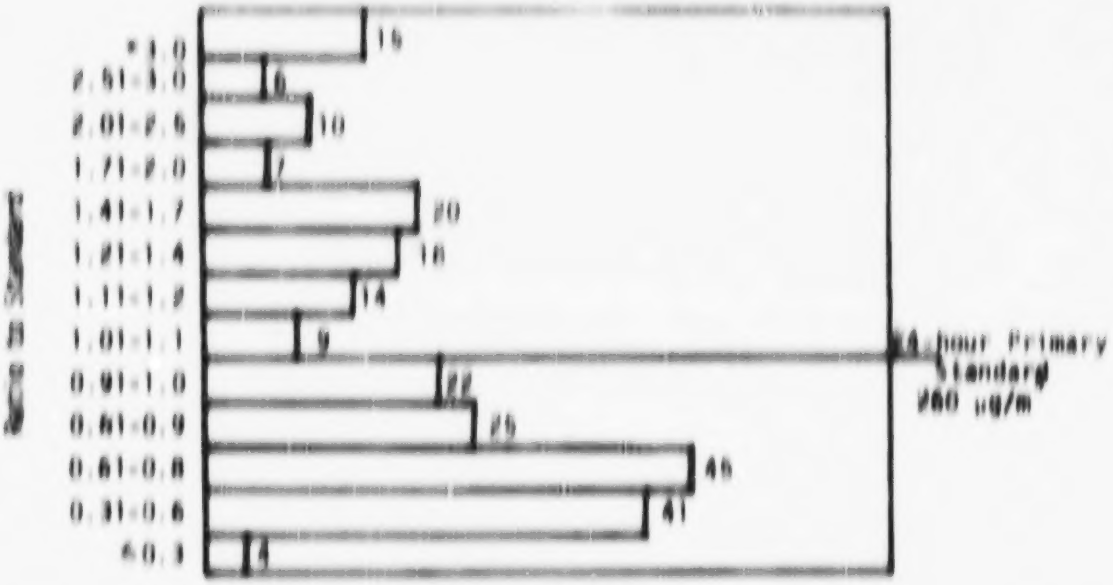

Figure VII - 1. Distribution of AQCRs reporting second-high 24-hour values for particulates (no data available for 11 AQCRs).

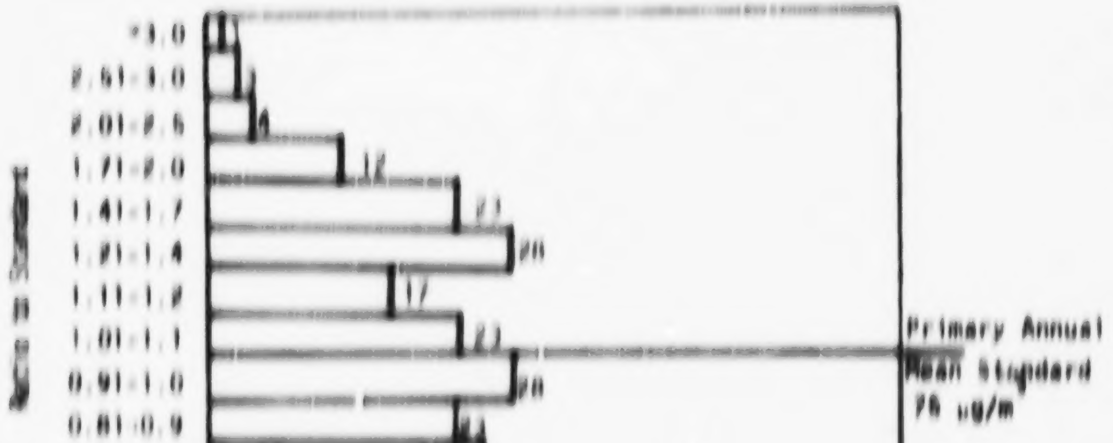

Figure VII - 2. Distribution of AQCRs reporting maximum annual mean values for particulates (no data available for 49 AQCRs).

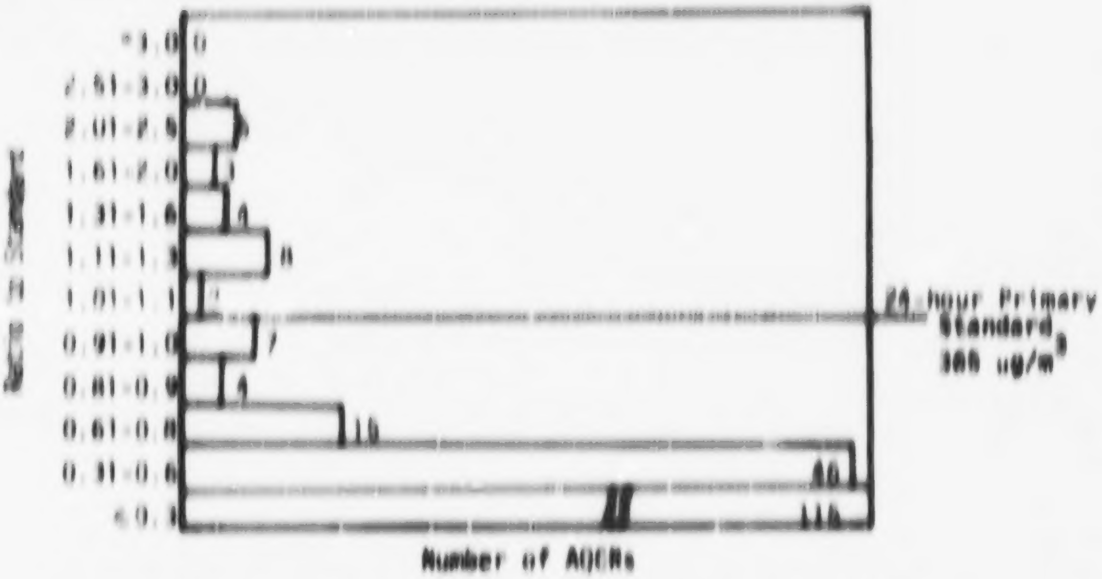

Figure VII - 3. Distribution of AQCRs reporting second-high 24-hour values for sulfur dioxide (no data available for 37 AQCRs).

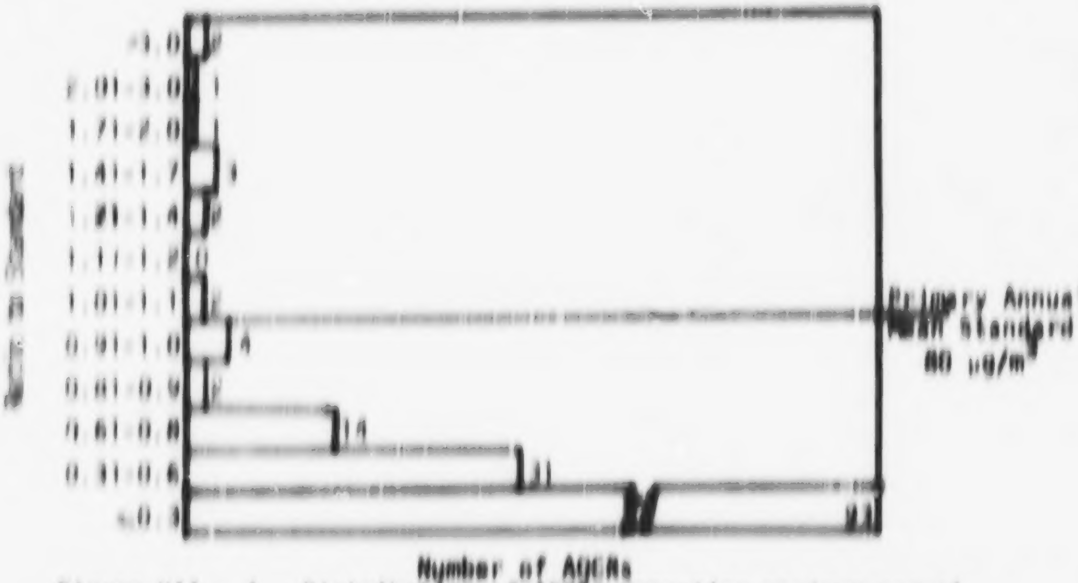

Figure VII - 4. Distribution of AQCRs reporting maximum annual mean values for sulfur dioxide (no data available for 92 AQCRs).

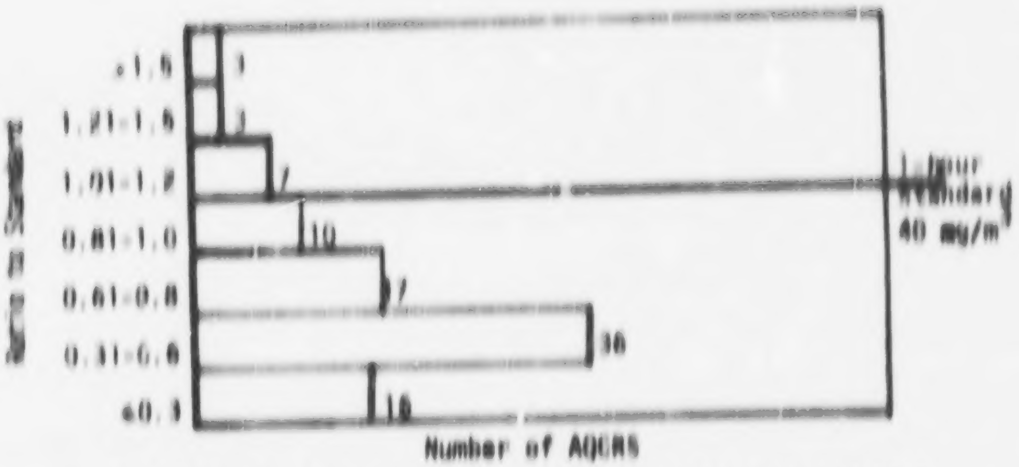

Figure VII - 5. Distribution of AQCRs reporting second-high one-hour values for carbon monoxide (no data available for 155 AQCRs).

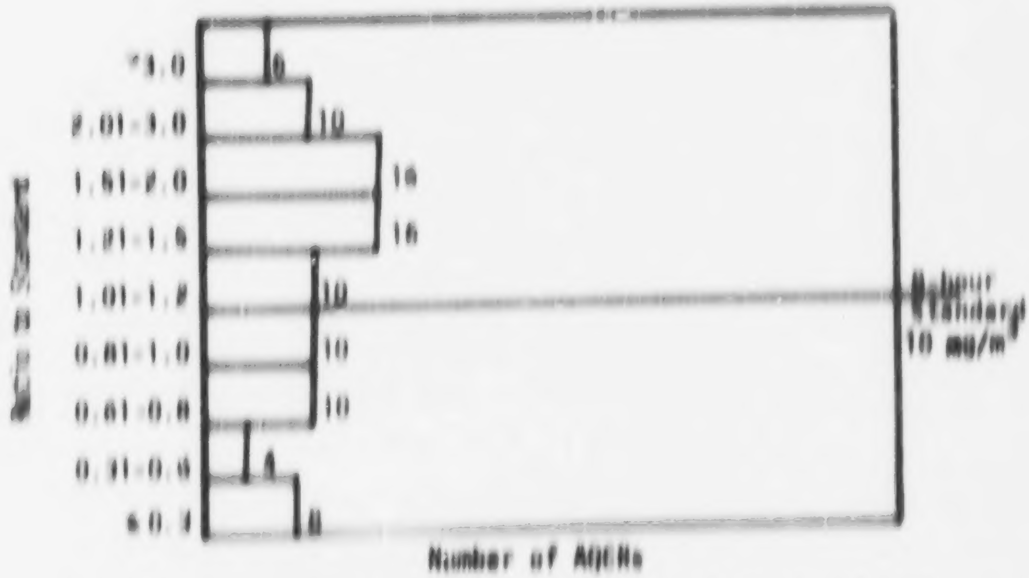

Figure VII - 6. Distribution of AQCRs reporting second-high 8-hour values for carbon monoxide (no data available for 157 AQCRs).

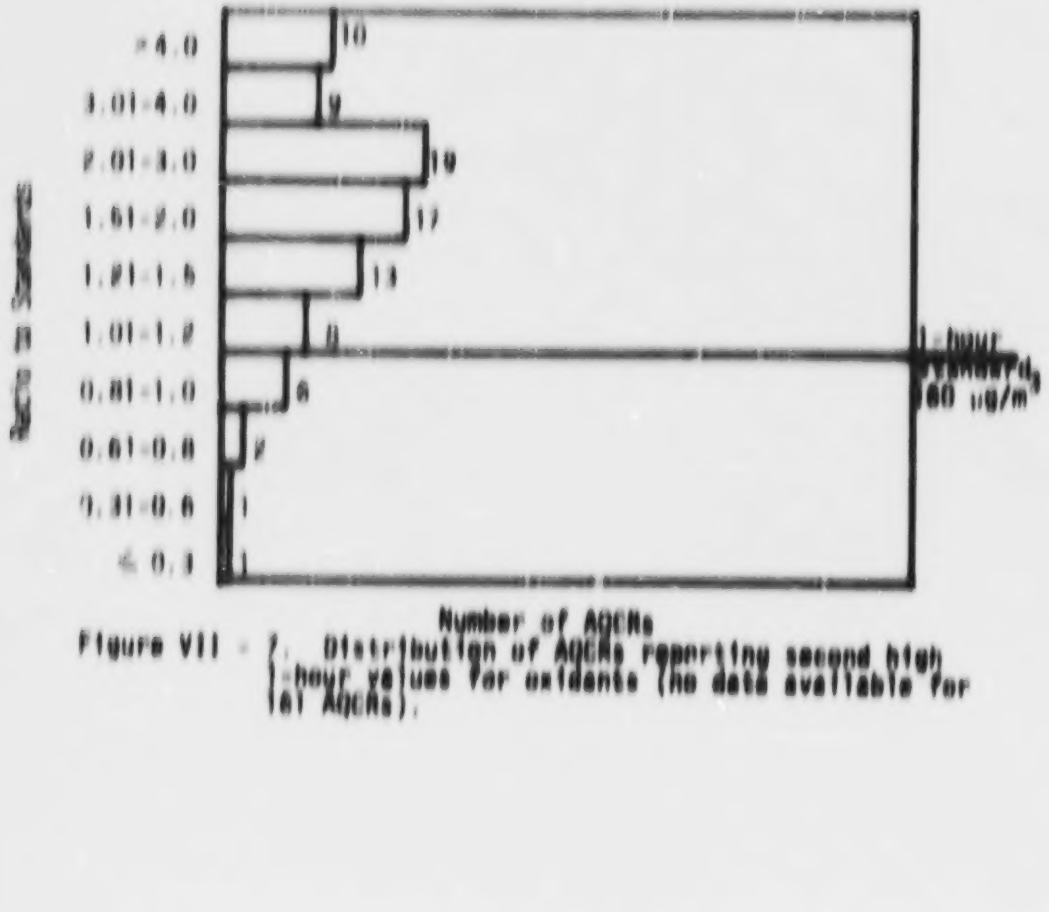

Figure VII - 7. Distribution of AQCRs reporting second high 1-hour values for oxidants (no data available for 161 AQCRs).

SUMMARY OF AMBIENT AIR QUALITY DATA

The status of air quality in the United States in 1974 was in many respects similar to that reported for 1973. Approximately the same percentage of reporting stations are still exceeding air quality standards, with one exception: an evident decline in the proportion of stations exceeding the 8-hour carbon monoxide standard.

All 247 AQCRs are required to be reporting at least one monitoring station for total suspended particulate (TSP). Of these, 198 AQCRs had at least one sampler station reporting enough data to compute a yearly average (four consecutive quarters of statistically valid data) for the primary annual TSP standard. Of the 2004 monitoring stations reporting a valid year's data, 1537 (77 percent) reported values achieving the annual standard. The 460 stations that had readings exceeding the standard were located in 111 of the 198 AQCRs reporting data sufficient to compute a yearly average.

All but 11 AQCRs reported minimal* data for the primary 24-hour TSP standard. Of the 3788 monitoring stations in these 236 AQCRs, 3462 (90 percent) reported values achieving the standard. The 326 stations that had readings exceeding the standard were located in 99 of the 236 AQCRs submitting minimal data.

As with particulates, all 247 AQCRs are required to be operating at least one sulfur dioxide (SO_2) monitoring station. Of these, 155 AQCRs reported a valid year's data for at least one station. Of the 1030 monitoring stations reporting a valid year's data, 999 (97 percent) reported values achieving the primary annual SO_2 standard. The 31 stations that reported values exceeding the standard were located in 11 of the 155 AQCRs submitting data sufficient to compute a yearly average.

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*At least three 24-hour samples from a hi-vol or a bubbler; or 400 hourly values from a continuous monitor.

All but 37 AQCRs reported minimal data for the primary 24-hour SO_2 standard. Of the 2241 reporting stations in these 210 AQCRs, 2142 (over 95 percent) reported values achieving the standard. The 99 stations that had readings exceeding the standard were located in 22 of the 210 AQCRs submitting data.

Carbon monoxide (CO) data were reported from 377 stations in 92 AQCRs. (Not all AQCRs are required to have CO monitors.) The 1-hour CO standard was achieved by 350 stations (93 percent) in 13 AQCRs; the 8-hour CO standard was achieved by 166 stations (44 percent) in 58 AQCRs.

Oxidant/ozone (O_x/O_3) data were reported from 343 stations in 86 AQCRs. (Not all AQCRs are required to have O_x/O_3 monitors.) The 1-hour standard was achieved by 70 of those stations (20 percent) representing 76 AQCRs.

Nitrogen dioxide (NO_2) measurement methods are still being reviewed for the purpose of redesignating a Federal reference method. Valid annual data for NO_2 were reported from 582 stations using methods that are deemed candidates for the status of reference or equivalent methods. These stations are located in 101 AQCRs. Only 18 stations in four AQCRs exceeded the currently defined annual standard for NO_2.

Although data reporting is improving, some difficulties persist in acquiring or reporting a full year's data for many monitoring stations. This situation continues to handicap the evaluation of the nation's air quality. From the preceding paragraphs it can be deduced that of the 3788 TSP monitoring stations and 2241 SO_2 monitoring stations reporting minimal data in 1974, only 53 percent and 46 percent, respectively, reported data sufficiently complete to permit calculating a valid annual mean. This not only means that the annual standards for these pollutants can only be evaluated at about half the existing stations, but also that the incidence of 24-hour standard violations is inconclusive wherever the data record is incomplete. Thus, expediting the flow of data from the state and local monitoring agencies to EPA's national data bank is being given increased emphasis.

TRENDS IN AIR QUALITY, 1970-1974

Historical trends in air quality levels afford a convenient guide to determining progress in the control of air pollution. For some pollutants, lack of historical data on a national basis limits the inferences that may be made. However, the recent expansion of air pollution monitoring networks is providing data that will serve as a baseline for future trend assessment. Currently, a good historical data base on the national level is available for total suspended particulate and sulfur dioxide primarily in urbanized areas. For oxidant, carbon monoxide, and nitrogen dioxide, historical data are limited and the geographical distribution is very sparse. Therefore, trends for these three pollutants are considered as a series of special cases. The present status of historical data reflects the evolution of air pollution monitoring efforts. For the most part, initial efforts were concentrated on the assessment of total suspended particulate and sulfur dioxide in center city areas.

Based on composite averages from 1096 sites, TSP levels have improved from 1970 to 1974. During this period, the composite annual average declined from 80 to 66 µg/m^3. This is an overall decrease of 17 percent, or slightly less than 5 percent per year. This improvement was generally reflected throughout the nation but specific localities are still experiencing TSP levels in excess of the National Ambient Air Quality Standards. The principal control problems are fugitive dust and urban background. During this period, the estimated reduction in particulate emissions was 29 percent.

Sulfur dioxide levels have declined from an annual composite average of 38 µg/m^3 in 1970 to 26 µg/m^3 in 1974. These averages are based on data from 256 sites and represent an overall decrease of 32 percent, or approximately 9 percent per year. However, over 90 percent of these sites are located in urbanized areas and caution must be used in generalizing these results. During this period, the decrease in estimated emissions was 8 percent. The much greater reduction in ambient SO_2 levels may reflect the shift in SO_2 emissions away from center city areas. Thus, the overall decline in SO_2 levels may be the combined result of emission reductions and redistribution of emission patterns. The data for 1975 are expected to show some additional decline in SO_2 in response to the mid-1975 compliance deadline.

Carbon monoxide trends in the few cities having historical data suggest general improvement. This is consistent with the automobile emission reductions during this period. Data from the States of California, New Jersey, New York, and Washington show reductions in the percent of time the 8-hour CO standard is exceeded. The peak hourly values have been relatively stable, but in the majority of urban areas the 8-hour standard is the more serious problem and this is where improvement is being shown. Los Angeles and New Jersey monitoring data indicate that the percent of time the 8-hour CO standard was exceeded was reduced by approximately 50 percent from 1970-1971 to 1973-1974 (roughly 12 percent to 6 percent). The State of Washington showed consistent progress during the 1971-1973 period, and New York State and San Francisco data showed that less than 0.5 percent of the 8-hour values were above the standard. On a national basis, the number of CO monitoring sites increased consistently during 1970-1974, with more than a 400 percent increase in 1974 over 1970 and a 25 percent increase in 1974 over 1973.

Oxidant trends in California continue to show long-term improvement. Data in the Los Angeles and San Francisco areas show 20 to 50 percent decreases in the number of times the 1-hour oxidant standard was exceeded. However, an important characteristic of the oxidant problem is the recognition of the wide spatial distribution of high oxidant levels. Recent studies have focused attention on oxidant as an area-wide phenomenon extending even to rural areas. The number of oxidant or ozone monitors has increased nationally by almost 800 percent between 1970 and 1974 with a 30 percent increase in 1974 over 1973. As these sites continue to report data, it will become possible to examine oxidant trends on a much broader basis.

Measurements of oxidants at rural stations from Ohio into Maryland and Pennsylvania through the summer of 1974 have confirmed earlier reports of high oxidant concentrations remote from urban areas. The history of air masses, plus the presence of distinctive man-made pollutants in the air masses, strongly suggests that the observed oxidant concentrations are the product of man-made ingredients received by the air masses in passing over an urban area. These ingredients continue to react, forming photochemical oxidants, as the air masses move across the countryside.

Nitrogen oxide emissions have increased nationally since 1970 and upward trends in NO_2 have been seen in Los Angeles and Philadelphia. Because of recent changes in measurement methodology for monitoring nitrogen dioxide, very few areas have sufficient historical data to assess NO_2 trends during the 1970-1974 period. However, between 1973 and 1974, the number of stations reporting a complete year of acceptable NO_2 data increased by almost 800 percent so that future reports should be able to more accurately assess national trends in NO_2 levels.

Nationwide estimates of pollutant emissions from 1970 through 1974 show steady declines in the tonnages of particulates and carbon monoxide being dumped into our air. Emissions of sulfur oxides and hydrocarbons evidence only slight declines. Nitrogen oxides show a slight increase in total emissions.

MONITORING IMPLICATIONS OF THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT (ESECA)

Fossil fuel-fired electric generating plants and other major fossil fuel users are being encouraged, where feasible, to convert from oil or gas to coal. Adaptability of the equipment is, of course, an essential element of this feasibility. The Act provides that air quality in the area shall also be a guiding determinant of whether the fuel conversion should be made and, if so, the nature of the emission control equipment that may be required. EPA is requiring the owners or operators of those facilities that are granted compliance extensions to install sulfur dioxide monitors (and, in some cases, monitors for TSP and sulfates) around such facilities and to report the resulting data to EPA. These data will supplement the state and local monitoring network data in EPA's evaluations of compliance, progress toward compliance, and potential deterioration of air quality.

VIII. THE DEVELOPMENT OF INSTRUMENTATION TO MONITOR EMISSIONS AND AIR QUALITY

Methods for the quantitative detection of pollutants in air are essential to EPA's abatement and control program. Initially, methods are needed to determine the extent and causes of a pollution problem and to investigate the health and welfare effects of the pollutants. When standards are promulgated, reference or compliance methods must also be promulgated for determining achievement and maintenance of the standards. Furthermore, implementation plans call for determining ambient air quality levels and stationary and mobile source emission levels. For these applications, the methods and associated devices employed must be low cost, reliable, and capable of unattended operation or use by relatively untrained personnel.

In the area of air quality measurements technology, the major problems relate to the separation of particulate matter into fine and coarse fractions and a measurement of specific chemical entities, such as sulfates, which are found in the fine particle fraction. Also, research is being carried out to provide measurement technology for specific toxic materials, such as vinyl chloride, nitrosamines, and aerocarcinogens, that are present in the air near sources of these materials. For source emissions, the major problem is that of the proper interfacing of instruments with the source to allow representative samples to reach the instrument. There is also the time-consuming and expensive problem of evaluation of all relevant sources because interfering substances and conditions vary from source to source. Source emission measurement technology has advanced for many types of sources, but for other sources it is still in a developmental stage.

MONITORING DEVELOPMENTS

Source Emission Measurement

Researchers made further advances in the technology of source emission measurement during 1975. Research activities concerning analytical techniques for use in implementing stationary source emission standards included: (1) developing monitors for SO_2 (including in situ, extractive, and remote methods) and sulfuric acid mist; and (2) evaluating previously developed in situ and remote SO_2 monitors, two methods for measuring ammonia emissions, and the use of a transmissometer as a particle mass monitor for several source categories including coal-fired power plants. Other significant advances included developing a prototype transpiration probe for quantitative sampling and preconditioning of particle emissions; establishing the feasibility of a portable lidar instrument for remote measurement of plume opacity; demonstrating the use of a new x-ray diffraction method as a rapid screening technique for asbestos analysis; and designing and constructing a compact x-ray analyzer for on-site monitoring of emissions of potentially hazardous trace elements.

Mobile source emission measurement research resulted in the development of a colorimetric procedure to measure sulfate emissions from automobiles and the automation of the procedure for routine use in testing 1975 production vehicles. The procedure will be used to implement a forthcoming sulfate emission standard. Other research efforts demonstrated that an infrared spectrometer based on the gas filter correlation principle could be used effectively for analyzing several gaseous pollutants (e.g., formaldehyde, methane, CO, and CO_2) in automotive exhausts.

Ambient Air Measurement

Several important developments occurred during 1975 concerning instruments and techniques to measure ambient air pollutants. Researchers developed and field-tested a dichotomous sampler for particulate matter. Sampler operates on automatically programmed sampling periods of a few hours, and segregates the collected particles into two size ranges--respirable and non-respirable. It also rejects very large particles, thus eliminating the undue influence they exert on mass values. The dichotomous sampler overcomes the major shortcomings of high-volume samplers, namely, the inability to sample meaningfully for periods of less than 24 hours and to discriminate fine particles.

Two unique instruments have been developed and are presently in the field-testing stage. One is an instrument to measure vinyl chloride. The instrument uses a detector operating on chemiluminescence principles in combination with an automated gas chromatograph possessing the required specificity and sensitivity for vinyl chloride. The other instrument is a device to measure low levels of airborne sulfuric acid mist. The device captures droplets of mist on an inert filter, then conveys the collected acid to a sensitive sulfur-specific detector. It is capable of sampling and analyzing cyclically every hour.

QUALITY CONTROL

A quality control strategy was adopted by the Environmental Protection Agency in February 1973. Its goal is to improve and document the quality of all environmental measurements, ensuring that data collected by EPA, contractors, or state and local agencies have the highest validity. The program incorporates five major functions: 1) standardization of measurement methods, 2) distribution of standard reference materials, 3) publication of procedures and guidelines, 4) evaluation of on-going monitoring activities, and 5) training and technical assistance.

Standard measurement methods have been established for all of the regulated ambient air pollutants except NO_2, and testing of systems required for measuring source emissions has progressed on schedule. Respositories of standard reference materials have been established. A number of quality control guidelines manuals are now available for air measurement. Training in the use of quality control guidelines and calibration standards is proceeding on schedule. Inter-laboratory performance testing programs have been initiated for air pollutant measurements. On-site evaluations of all EPA monitoring laboratories were initiated in April 1974, and 10 Regional laboratories have been evaluated. Procedures are being developed to evaluate any field monitoring laboratory, and the feasibility of a certification system for environmental monitoring laboratories is under study.

IX. DEVELOPMENT OF NEW AND IMPROVED AIR POLLUTION CONTROL TECHNIQUES FOR STATIONARY SOURCES

The development and demonstration of control technology for stationary source air pollution is one of EPA's largest tasks. Approximately $88 million was devoted to this effort in Fiscal Year 1975. These funds supported both on-going studies to demonstrate control methods for sulfur and nitrogen oxides, particulates and other pollutants, and expanded programs addressing the environmental aspects of accelerated energy resource development in the United States.

EPA's goal in stationary source air pollution control development is fourfold:

- To describe at least one method for control of each major source of pollution;
- To provide a technical base for the Agency's enforcement activities;
- To establish technical and economic data to support New Source Performance Standards (NSPS); and
- To provide information required to make environmentally sound decisions on energy development policy.

SULFUR OXIDES

Much of the Agency's research and development effort in sulfur dioxide (SO_2) control has been directed toward the demonstration of flue gas desulfurization (FGD) technology. This emphasis has been dictated by FGD's economic feasibility and by its availability for near-term application as compared to other SO_2 control options. EPA has funded, either totally or partially, a number of major projects over the past several years. Included in these projects are the following large-scale, electric utility-oriented projects:

- Pilot work (at Research Triangle Park, N. C.) and prototype systems (at the TVA Shawnee Steam Plant) for development, demonstration and optimization of lime and limestone scrubbing technology.
- Magnesium oxide scrubbing demonstrations at Boston Edison Company and Potomac Electric Power Company.
- Catalytic-oxidation scrubber demonstration at Illinois Power Company.
- Sodium sulfite/bisulfate scrubbing (Wellman-Lord Process) at Northern Indiana Public Service Company.

Control techniques suited for smaller industrial and commercial combustion sources are being examined through full-scale test programs at a General Motors Double Alkali installation and a U.S. Air Force installation using the Rahco lime scrubbing process.

The major demonstration projects are supported and supplemented by other full-scale testing, numerous engineering studies and smaller-scale hardware projects. The commercial economics of FGD by-product marketing and disposal options, and the evaluation of new processes and process improvements are the subjects of continuing engineering efforts. A major effort underway in technology transfer will promote use of the best and most reliable techniques and equipment for future FGD installations.

A second method of reducing sulfur oxide (SO_x) emissions is to remove sulfur and other contaminants from the fuel prior to combustion. This pretreatment method of control is appropriate to SO_x sources smaller than electric utility size, e.g., boilers and fuel-burning equipment. EPA is supporting programs for research, development and environmental assessment of several approaches for removing pollutants from fuels. One technique--coal cleaning--involves methods of physically and/or chemically cleaning coal of moderate sulfur content so that it can be burned in conformance with clean air standards. EPA's objectives in this area are to develop commercially available processes for removing inorganic sulfur and ash from medium-sulfur coal, while rendering the coal-cleaning wastes suitable for reclamation or disposal in an environmentally acceptable manner. Another EPA program area involves clean synthetic fuels (high- and low-Btu gasified coal and liquefied coal). The major objectives are to determine the potential environmental impacts of synthetic fuel processing, and to develop control technology to minimize the negative effects of these environmental impacts.

A third method for controlling SO_x involves modification of the combustion process. Fluidized bed combustion (FBC) is the primary approach under consideration. As part of the National Fluidized Bed Combustion Program coordinated by the Energy Research and Development Agency (ERDA), EPA is conducting research to determine potential environmental problems arising from alternative designs and uses of fluidized bed combustors. EPA's participation in the interagency program consists of conducting environmental assessments of FBC systems; optimizing control of SO_2, NO_x, fine particulates and other pollutants; and continued testing of EPA's small (0.63 megawatt) FBC mini-pilot plant.

In addition to combustion sources, industrial processes make a significant contribution to the ambient SO_x problem. An effort is underway to evaluate and demonstrate SO_x control by a commercial molecular sieve process (Purasiv S) on tail gases from sulfuric acid production. The evaluation shows that the molecular sieve process is capable of limiting the SO_x concentration to 100 parts per million (ppm) in tail gases for most sulfuric acid plants. Work has also been initiated to identify alternative technologies for reducing petroleum refinery SO_x emissions to 80-90 percent below 1974 levels.

NITROGEN OXIDES (NO_x)

Combustion modification is the primary existing control technique for preventing or minimizing NO_x emissions from fossil-fuel burning. EPA-supported and directed efforts have shown that recirculating flue gas is a most effective technique for controlling NO_x emissions originating from thermal fixation of atmospheric nitrogen during the combustion of clean fuels (natural gas and distillate oils). Staged combustion (often combined with low excess air) is a most effective method for controlling NO_x emissions derived both from the thermal fixation of nitrogen emissions in the combustion air and from the conversion of nitrogen atoms chemically bound in the fuel (heavy oils and coal). Additional EPA research and development efforts are aimed at redesigning burner/combustor systems, investigating novel combustion modification approaches (such as catalytic combustion, advanced power cycles, and alternative fuels) for emission reduction, and providing a basic understanding of the physical and chemical factors influencing the formation and degradation of pollutants through fundamental combustion research.

NO_x flue gas treatment (FGT) is a relatively new control technique under investigation for its potential in accomplishing high-efficiency control of large stationary sources. A program eventually leading to a demonstration of the technique on large coal-fired sources is in direct response to increasing evidence that high-level control may be required to meet future NO_x standards.

Finally, in the industrial area, EPA is currently supporting a project to evaluate and demonstrate NO_x control by a commercial molecular sieve process (PuraSiv N) on tail gases from nitric acid plants. The evaluation demonstrates that the molecular sieve process is capable of economically limiting NO_x concentrations to at least 100 ppm, and quite possibly to 50 ppm, on tail gases from absorbers in nitric acid production.

PARTICULATES

Control technology for large particulates has been fairly well established, and EPA's efforts now are mainly concerned with development of techniques for the control of fine particulates (defined as that fraction of the particulate emission smaller than 3 microns). These small particles remain suspended in the atmosphere and are easily respirable and absorbable by the body. Fine particulates may contain toxic trace metals and sulfates, both of which have considerable impact on health. One current program seeks to better define the physical and chemical character of fine particulates.

Control technology for fine particulates is still seriously deficient. The Agency's present efforts center on developing adequate detection and measurement methods and on development and field testing of control methods. Additionally, EPA is working to improve and demonstrate existing collection capability for fine particulate control and to identify and ultimately to demonstrate novel techniques which will offer both economic and performance advantages over current methods.

OTHER POLLUTANTS

"Other" pollutants are both those pollutants for which no ambient air quality standards have been established and those three pollutants (asbestos, mercury, and beryllium) for which National Emissions Standards for Hazardous Air Pollutants (NESHAPs) now exist. Control technology research efforts are underway for a number of these pollutants, including trace metals, polycyclic organic matter (POM) and miscellaneous hydrocarbons, fluorides, and odors.

To assess the emission of these pollutants, several tasks are being funded for the field testing of coal-fired utility and industrial boilers, and for limited source characterization of gas- and oil-fired units. A field testing program is also planned for residential and commercial heating units.

Source assessment has also been started for certain chemical processing industries. The objective of this program is to assess the environmental impact of sources of toxic and potentially hazardous emissions from the organic materials, inorganic materials, combustion and open source categories and to determine the need for control technology development for given source types. Sources under assessment include petroleum refining, acrylonitrile, asphalt paving, solvent evaporation operations, rubber and plastic processing, phthalic anhydride, polyvinyl chloride, glass manufacturing, barium chemicals, fertilizer mixing plants, brick kilns, lead storage batteries, and ammonium nitrate.

Control technology for the ferrous metallurgical industries is under extensive development. Included in this area are emissions from cokemaking, sintering, iron-making in the blast furnace, and steel-making in the basic oxygen furnace. Additional programs are underway to assess and characterize fugitive emissions from integrated iron and steel plants and from the mining, beneficiation and pelletization of iron ores.

Efforts are underway to establish control techniques both for open sources and for selected closed sources of asbestos. The key sources include mining, milling, and manufacturing sites; the latter source tends to be located predominantly in urban areas and thus substantially increases human exposures to asbestos. The objectives here are to develop and demonstrate control technology for handling, unloading, and disposal operations and, in addition, to demonstrate a specific methodology for controlling closed sources of asbestos in manufacturing operations. Completed programs include a study to identify the sources of asbestos in the mining industry and a project to identify the optimum operating mode for maximum efficiency of baghouses for control of asbestos fibers. This work is undertaken to permit quantification of the existing NESHAPs for asbestos, thus allowing control effectiveness of the standard to be evaluated.

EPA is continuing development at the pilot plant level for the following sources: glass manufacturing plants, asphalt roofing plants, ethylene dichloride plants, coating operations for metal cans, hydrocarbon control for gasoline distribution systems, and odor control for the rendering industry.

X. STATUS OF STATE, INTERSTATE, AND LOCAL POLLUTION CONTROL PROGRAMS ESTABLISHED UNDER AND ASSISTED BY THIS ACT

A primary role of the EPA and the EPA Regional Offices has been to continue to improve the partnership between the Federal Government and the state and local control programs responsible for administering the provisions of the Clean Air Act. The Clean Air Act of 1970, as amended, in requiring State Implementation Plans places emphasis on the responsibility-sharing between the Federal, state, and local government units to achieve effective control programs. In 1975, 55 state and territorial agencies and 236 local agencies, working in coordination with states, expended approximately $140 million and 7000 man-years to carry out the major portions of the regulatory and enforcement aspects of the national air pollution control effort.

In meeting the obligations imposed by the Clean Air Act, many state agencies have continued to rely heavily on local expertise and resources. Historically, Federal support has been used to stimulate local agency growth and to encourage a regional or statewide approach to air pollution control. Tables X-1 and X-2 illustrate the extent of this Federal support to state and local agencies by organizational location of the agency within the state and local governmental structures and by jurisdictional areas served by these agencies.

Table 8-1. ORGANIZATIONAL LOCATION OF STATE AND LOCAL CONTROL AGENCIES RECEIVING FEDERAL FUNDS IN 1976

Principal organization type	State		Local		
	Total	Number receiving Federal funds	Total	Number receiving Federal funds	
				Direct	Indirect[a]
Environmental	22	22	21	12	1
Health	18	17	114	60	19
Air pollution	6	6	88	38	14
Natural resources	7	7	--	--	--
Other	2	2	13	10	--
Total	55	54	236	120	34

[a] Through specified provisions in grants to states

Table B-2. DISTRIBUTION OF FUNDS BY JURISDICTIONAL AREAS OF STATE AND LOCAL CONTROL AGENCIES[a] (ESTIMATED 1975 EXPENDITURES)

Jurisdictional category	Number of agencies	Federal $	State/local $	Total
Local				
Cities	44	$ 5,900,000	$14,300,000	$ 20,200,000
Counties[b]	91	10,400,000	24,000,000	34,400,000
Multi-county	27	3,100,000	9,300,000	12,400,000
Subtotal local	162	19,400,000	47,600,000	67,000,000
State[c]				
Subtotal state	54	33,200,000	47,800,000	81,000,000
Total	216	$52,600,000	$95,400,000	$148,000,000

[a] Total number of agencies receiving Federal monies for air pollution control work either directly or by designation in grant to state agency. Direct grants approximate 162 for 1976.

[b] Includes agencies that are combination city-county agencies, county agencies that service large metropolitan areas, and city agencies serving more than one county. Many county agencies cover a large metropolitan area, for example, Los Angeles County, California; Wayne County, Michigan (Detroit); Allegheny County, Pennsylvania (Pittsburgh).

[c] States include District of Columbia, Puerto Rico, Virgin Islands and Guam. American Samoa did not receive grant funds in 1976.

FEDERAL FINANCIAL ASSISTANCE TO AIR POLLUTION CONTROL AGENCIES

In 1975 EPA provided financial assistance to 54 state agencies (all except American Samoa) and 128 local agencies. In addition, 34 local agencies received Federal monies through specified provisions of state grants. The total expenditures of these 216 agencies represented approximately 98 percent of all expenditures for the 291 agencies having some air pollution control responsibilities. The support provided to the agencies was in the form of grants for planning, developing, establishing, improving or maintaining control programs. This support also included special contractual assistance and demonstration grants to assist the agencies in meeting deadlines imposed for the submittal, revision, and preparation of their implementation plans and for technical aspects of the enforcement and revisions associated with the regulatory and monitoring provisions of the local control strategies. The Federal support provided to states for Fiscal Years 1972, 1973, 1974, 1975, and 1976 (estimated) is summarized in Table X-3.

PROGRESS OF STATE AND LOCAL AIR POLLUTION CONTROL PROGRAMS

Total expenditures (Federal, state, local) for the support of air pollution have grown at an average annual rate of approximately 28 percent, from $13 million in Fiscal Year 1965 (FY 65) to an estimated $148 million in FY 75. The growth rate in FY 75 was approximately 14 percent over the FY 74 level.

The increase in the number of employees of state and local control agencies is an indicator of the nation's growing commitment to controlling air pollution. Table X-4 shows that control agency staff has tripled in

Table [illegible]. SUMMARY OF FEDERAL SUPPORT[a] TO STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES BY STATE

State or Territory	FY 1972	FY 1973	FY 1974	FY 1975 Preliminary	FY 1976, Estimated[b]
Alabama	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Alaska	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arizona	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arkansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
California	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Colorado	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D. C.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Florida	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Georgia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hawaii	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Idaho	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Illinois	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Indiana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 1-2 (continued). SUMMARY OF FEDERAL SUPPORT[a] TO STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES BY STATE

State or territory	FY 1972	FY 1973	FY 1974	FY 1975 Preliminary	FY 1976 Estimated[b]
Iowa	$ 359,392	$ 461,259	$ 573,788	$ 525,802	$ 675,000
Kansas	335,767	376,339	476,350	486,773	595,000
Kentucky	759,028	1,176,502	953,467	983,103	988,000
Louisiana	175,000	349,959	487,288	377,185	580,000
Maine	+	245,349	186,000	174,387	238,000
Maryland	587,085	1,256,108	1,365,487	1,354,829	1,380,000
Massachusetts	794,305	1,247,759	1,176,582	1,275,401	1,380,000
Michigan	1,613,570	1,888,772	1,888,428	2,038,806	2,180,000
Minnesota	355,600	667,774	674,850	482,338	1,350,000
Mississippi	427,724	388,852	327,875	384,000	460,000
Missouri	717,574	1,146,858	1,208,688	1,165,135	1,720,000
Montana	231,465	335,000	335,000	347,555	460,000
Nebraska	237,589	347,776	488,842	334,759	355,000
Nevada	345,702	347,555	281,711	288,789	288,000
New Hampshire	185,405	227,089	172,546	174,324	288,000

Table I-3 (continued). SUMMARY OF FEDERAL SUPPORT[a] TO STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES BY STATE

State or Territory	FY 1972	FY 1973	FY 1974	FY 1975 Preliminary	FY 1976 Estimated[b]
New Jersey	$2,135,247	$1,657,252	$2,176,344	$2,374,964	[illegible]
New Mexico	735,445	352,545	[illegible]	518,538	[illegible]
New York	3,957,790	4,740,357	4,908,557	4,535,479	[illegible]
North Carolina	1,488,039	1,757,238	1,361,523	1,481,156	[illegible]
North Dakota	45,220	67,958	[illegible]	144,300	[illegible]
Ohio	1,796,752	2,450,000	2,885,679	2,517,465	[illegible]
Oklahoma	424,906	461,468	471,588	508,457	[illegible]
Oregon	486,033	567,300	[illegible]	[illegible]	[illegible]
Pennsylvania	2,338,710	2,550,725	2,805,400	3,056,440	[illegible]
Rhode Island	155,885	197,707	[illegible]	202,165	[illegible]
South Carolina	111,785	373,546	453,557	567,384	[illegible]
South Dakota	32,025	32,000	27,667	113,825	[illegible]
Tennessee	703,674	1,165,570	894,377	1,135,252	[illegible]
Texas	2,503,359	2,780,525	[illegible]	[illegible]	[illegible]
Utah	-0-	164,186	[illegible]	152,700	[illegible]

Table 1-3 (continued). SUMMARY OF FEDERAL SUPPORT[a] TO STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES BY STATE

State or territory	FY 1972	FY 1973	FY 1974	FY 1975 Preliminary	FY 1976 Estimated[b]
Vermont	$ 274,435	$ 173,889	150,000	164,640	230,000
Virginia	1,062,000	1,085,674	987,387	1,258,729	1,350,000
Washington	1,129,970	1,208,303	1,085,408	1,165,274	1,180,000
West Virginia	377,620	536,935	718,470	840,000	430,000
Wisconsin	955,440	822,710	824,770	956,757	1,050,000
Wyoming	66,133	88,824	102,000	102,000	120,000
American Samoa	-0-	-0-	-0-	-0-	-0-
Guam	34,774	-0-	66,750	70,000	70,000
Puerto Rico	464,477	697,552	255,724	359,667	380,000
Virgin Islands	100,245	72,600	77,725	75,000	90,000
Subtotal	$40,377,381	$47,882,510	$49,209,365	$52,277,782	$54,595,000
Special support[c]		2,964,259	2,975,994		
Multiregional projects				390,053	673,000
Total	$40,377,381	$50,846,769	$52,185,359	$52,667,835	$55,268,000

Table 5-3 (continued). SUMMARY OF FEDERAL SUPPORT[a] TO STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES BY STATE

State or territory	FY 1972	FY 1973	FY 1974	FY 1975 Preliminary	FY 1976 Estimated[b]
Federal fiscal year budget		[illegible]	[illegible]	[illegible]	[illegible]

[a] Federal support amounts are related to Federal fiscal year and include grants, State Assignees, and special assistance (contracts, demonstration grants). For most states, dollars do not relate to budgets for the state's fiscal year.

[b] Estimated awards for FY 76 include grants, State Assignees, and special assistance monies (contractor assistance and demonstration grants). These amounts are for planning purposes only and each state's final amount will differ and will be provided the individual state by the EPA Regional Office.

[c] Special support monies shown for FYs 75 and 76 are multiregional/contractor and demonstration grant assistance benefitting several states. The majority of special support monies for FYs 75 and 76 (approximately $2.8 million) are shown within the appropriate state's total. In FY 72 special support funds were not considered as being part of control agency support funds.

Table 8-4. ESTIMATED MAN-YEARS OF EFFORT EMPLOYED BY STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES[a]

Fiscal year	State		Local		Total state/local	
	Positions	Man-years	Positions	Man-years	Positions	Man-years
1969	1000	920[b]	1840	1660[b]	2840[b]	2580
1971	1540	1420[b]	2630	2370[b]	4170[b]	3790
1973	2930	2770	3270	2870	6200	5640
1974	3970	3490	3270	3000	7240	6490
1975[c]	4360	3800	3680	3200	8040	7000

[a] All figures involve estimating full- and part-time positions either from manpower surveys or budgets provided in grant awards.

[b] Estimated from position information using verified man-year/position ratios from 1973 and 1974.

[c] 1975 estimates based on preliminary information.

the last six years. The 1975 on-board positions represent approximately 7000 equivalent full-time man-years of effort.

Resources increased by approximately 500 man-years and $18 million between June 1974 and July 1975. These increases were approximately the same as the previous year's. Resources improved principally because state and local funds increased approximately 20 percent ($17 million) over FY 74 levels. Federal support to these agencies increased by approximately 2 percent ($1.6 million).

The focus of Federal support to state and local control agencies has been on the achievement of State Implementation Plans and national priorities. In FY 75 the agencies gave highest priority to the enforcement actions necessary for attaining total suspended particulate and sulfur dioxide National Ambient Air Quality Standards and improvements to monitoring networks required for continual assessment of pollutant concentrations. The estimated percentage of resources committed to various aspects of these national efforts to attain standards is shown in Table X-6.

Table X-5. ESTIMATED PERCENTAGE OF RESOURCES DEVOTED TO AIR POLLUTION CONTROL ACTIVITIES OF NATIONAL PRIORITY BY STATE AND LOCAL CONTROL AGENCIES IN FY 76

Activity	Estimated percentage of resources
Compliance with State Implementation Plan regulations	44
State Implementation Plan revisions and completion	6
Transportation Control Plans and mobile source inspection and investigation	7
Air monitoring network operation and completion	18
Supportive tasks (management, data and policy review, environmental impact statements, training, etc.)	25
	100

XI. REPORTS AND RECOMMENDATIONS OF THE PRESIDENT'S AIR QUALITY ADVISORY BOARD

The President's Air Quality Advisory Board was abolished on January 5, 1975, under the provisions of the Public Advisory Committee Act of 1972 and therefore there are no reports or recommendations to report.

APPENDIX. SUMMARY OF EPA ENFORCEMENT ACTIONS
SECTION 113 - STATE IMPLEMENTATION PLANS
JULY - DECEMBER 31, 1975

LOCATION	COMPANY/TYPE OF SOURCE	POLLUTANT INVOLVED	TYPE OF ACTION
Alabama, Birmingham	U.S. Pipe	Particulate matter	Consent order entered [illegible]
Alabama, [illegible]	Alabama Power Co. Power Plant	Particulates	NOV 12/5/75
Alabama, [illegible]	Alabama Power Co.-Gorgas Power Plant	Particulates	NOV 12/5/75
Alabama, [illegible]	Alabama Power Co.-E.C. Gaston Power Plant	Particulates	NOV 12/5/75
Alabama, [illegible]	Alabama Power Co.-Barry Power Plant	Particulates	NOV 12/5/75
Alabama, Gadsden	Alabama Power Co.-Gadsden Power Plant	Particulates	NOV 12/5/75
Alabama, [illegible]	Tennessee [illegible] Corp. Power Plant	Particulates	NOV [illegible]
Alabama, [illegible]	A.B. [illegible] [illegible]	Particulates	NOV [illegible]
Alabama, [illegible]	[illegible] Copper & Brass, Inc. Secondary aluminum plant	Particulates	NOV [illegible]

NOV - Notice of violation.

[illegible]	[illegible]	[illegible]	[illegible]
Alabama, [illegible]	[illegible] Co. [illegible] [illegible]	Particulate	[illegible]
Alabama, [illegible] City	[illegible] Industrial Boilers	[illegible]	[illegible]
Alabama, [illegible]	[illegible] Foundry Gray Iron Foundry	Particulate	[illegible]
Alabama, [illegible]	[illegible] Co. Gray Iron Foundry	Particulate	[illegible]
Alabama, [illegible]	[illegible] Gray Iron Foundry	Particulate	[illegible]
Alabama, [illegible]	[illegible] Chemical Co. [illegible] Acid Plant	[illegible]	[illegible]
Alabama, [illegible]	[illegible], Inc. [illegible]	Particulate	[illegible]
Alabama, [illegible]	[illegible], Inc. [illegible]	Particulate	[illegible]
Alabama, [illegible]	[illegible] Corp. Gray Iron Foundry [illegible]	[illegible]	[illegible]
Alabama, [illegible]	[illegible] Foundry Co. Gray Iron Foundry	Particulate	[illegible]
Alabama, [illegible]	[illegible] [illegible]	[illegible]	[illegible]
Alabama,	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
California, [illegible]	[illegible]	Violation of federally promulgated State new source review regulation	NOV [illegible]
California, [illegible]	[illegible] Terminals, Inc. [illegible]	Violation of federally promulgated State new source review regulation	NOV [illegible]
California, [illegible]	City of Los Angeles Dept. [illegible]	Violation of federally promulgated State new source review regulation	NOV [illegible]
Connecticut, [illegible]	[illegible]	[illegible]	Order [illegible] Amendment to Order [illegible]
Connecticut, [illegible]	[illegible]	[illegible]	Order [illegible]
Connecticut, [illegible]	[illegible]	[illegible]	[illegible] Amendment to [illegible]
Connecticut, [illegible]	[illegible]	[illegible]	Order [illegible]
Connecticut, [illegible]	[illegible]	[illegible]	NOV [illegible]
Delaware, [illegible]	[illegible]	[illegible]	Order [illegible]
District of Columbia	[illegible]	[illegible]	[illegible]
Florida, [illegible]	[illegible]	[illegible]	[illegible]

STATE/CITY	COMPANY/TYPE OF SOURCE	POLLUTANT INVOLVED	TYPE OF ACTION
Florida, Tampa	Gardinier Agricultural Chemicals	[illegible] emissions	Consent order issued [illegible]
Florida, [illegible]	C.F. Industries, Inc.	SO_2 emissions	Consent order issued [illegible]
Florida, Pace	Air Products & Chem. Nitric Acid Plants	NO_x	NOV 12/11/75
Florida, Ft. Pierce	Agrico Chemical Co. Sulfuric Acid Plants	SO_2	NOV 12/11/75
Florida, Jacksonville	C.I. [illegible] Co. Gray Iron Cupola	Particulate	NOV 12/11/75
Florida, Titusville	Orlando Utilities Commission Power Plant	Particulate	NOV 12/[illegible]/75
Florida, Mulberry	Royster Company Sulfuric Acid Plant	SO_2	NOV 12/11/75
Florida, Tampa	Tampa Municipal Incinerator Incinerator	Particulate	NOV 12/[illegible]/75
Florida, Ft. Lauderdale	City of Ft. Lauderdale Incinerator	Particulate	NOV 12/11/75
Florida Plant City	Borden Chemical Defluorination Plant	Particulate	NOV 12/11/75
Georgia, Albany	[illegible] 3-power boilers (coal fired)	Particulate	NOV 12/[illegible]/75
Georgia, Brunswick	Brunswick Pulp recovery boiler	Particulate	NOV 12/[illegible]/75

[illegible]	[illegible]	[illegible]	[illegible]
Georgia, [illegible]	[illegible]	Particulate	[illegible]
Georgia, [illegible]	[illegible]	Particulate	[illegible]
Georgia, [illegible]	[illegible]	Particulate	[illegible]
Georgia, [illegible]	[illegible]	Particulate	[illegible]
Guam [illegible]	[illegible]	[illegible]	[illegible]
Hawaii, [illegible]	[illegible]	[illegible]	[illegible]
Hawaii, [illegible]	[illegible]	[illegible]	[illegible]
Hawaii, [illegible]	[illegible]	[illegible]	[illegible]
Hawaii, [illegible]	[illegible]	[illegible]	[illegible]
Idaho [illegible]	[illegible]	[illegible]	[illegible]
Idaho [illegible]	[illegible]	[illegible]	[illegible]
Idaho	[illegible]	[illegible]	[illegible]

STATE/CITY	COMPANY/TYPE OF SOURCE	POLLUTION PROBLEM	TYPE OF ACTION
[illegible]	[illegible] [illegible]		
Idaho Pocatello	FMC Corporation Ore crusher	particulate matter	NOV [illegible]
Idaho Don	J.R. Simplot Co. [illegible] [illegible] [illegible]	Failure to register NSPS Testing	consent order [illegible] NOV [illegible]
Idaho Twin Falls	Amalgamated Sugar [illegible] [illegible]	particulate matter VE	NOV [illegible]
Idaho Twin Falls	[illegible] [illegible] [illegible] [illegible]	particulate matter	NOV [illegible]
Idaho Kellogg	Bunker Hill Co. lead & zinc smelter	particulate matter (fugitive emissions)	order [illegible]
Illinois Chicago	[illegible] Corporation printing presses	hydrocarbon	NOV [illegible]
Illinois [illegible]	[illegible] [illegible] [illegible] [illegible] - power plant	SO2	consent order [illegible]
Illinois Rockford	[illegible], Inc. [illegible]	particulate	consent order [illegible]
Illinois Sterling	Northwestern Steel & Wire Co. electric arc furnaces	particulate	consent order [illegible]
Illinois [illegible]	City of [illegible] municipal power plant	particulate & SO2	NOV [illegible]
Illinois Chicago	[illegible] Corp. printing presses	hydrocarbon	Consent order [illegible]
Illinois Pekin	Commonwealth Edison Powerton station #5	SO2	NOV [illegible]
Illinois [illegible]	CILCO [illegible] [illegible] [illegible]	NSPS for SO2	NOV [illegible]
Illinois Springfield	City Water, Light & Power Dept. City Generating Sta. (Dallman)	NSPS for SO2	NOV [illegible]
Illinois	Commonwealth Edison	SO2	NOV [illegible]

LOCATION	COMPANY/TYPE OF SOURCE	POLLUTANT EMITTED	TYPE OF ACTION
[illegible]	[illegible] Co. No. [illegible]		
Illinois Rochelle	City of Rochelle/Rochelle Steam Plant - Coal Fired Boilers	particulate	NOV 12/[illegible]/75
Illinois Peoria	Caterpillar Coal fired boilers	particulate & SO2	NOV 12/[illegible]/75
Illinois [illegible]	[illegible] Electric	SO2	NOV 12/[illegible]/75
Indiana Terre Haute	[illegible] [illegible] Co.	particulate	consent order [illegible]/75
Indiana East Chicago	Inland Steel/Indiana Harbor Works	particulate & SO2	consent order [illegible]/75
Indiana Richmond	Johns-Manville Corp. Melting furnaces	particulate	consent order 12/[illegible]/75
Indiana Crawfordsville	Crawfordsville Electric Light & Power Company	particulate	NOV 12/[illegible]/75
Indiana [illegible] ([illegible])	Public Service Co. of Indiana Gibson Generating Sta.	[illegible]	NOV 12/[illegible]/75
Indiana East Chicago	Inland Steel Co. [illegible]	particulate & SO2	NOV 12/[illegible]/75
Indiana East Chicago	Inland Steel Coke Batteries	particulate	NOV 12/[illegible]/75
Iowa Middletown	Iowa Army Ammunition Plant (Dept. of Army)	particulate	Memorandum of understanding (MOU) 12/[illegible]/75
Iowa Cedar Rapids	Wilson & Co. Inc.	particulate	order 12/[illegible]/75
Iowa	[illegible] Foundry Corp.	particulate	order [illegible]/75

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			
Iowa Clinton	[illegible] Chemical Co.	SO2	order 8/22/75
Iowa Cedar Rapids	Penick & Ford, Ltd.	particulate	order 8/24/75 - 9/1/75
Iowa [illegible]	[illegible] Carbide Corp.	particulate & SO2	order 8/28/75
Iowa Davenport	[illegible] [illegible]	particulate	order 6/25/75
Iowa [illegible]	Central Iowa Power Cooperative	particulate	order 7/29/75
Iowa Des Moines	[illegible], Inc. - Spray Dryer	particulate/process wt.	order 7/25/75 amended 7/30/75
Iowa Charles City	White Farm Equipment Co.	particulate/process wt. SO2	order 8/7/75
Iowa Cedar Rapids	Cargill, Inc. East Plant	particulate	order 8/7/75
Iowa [illegible]	[illegible] Co.	particulate	order 9/1/75
Iowa Centerville	The [illegible] Corp.	particulate	order 9/1/75
Iowa Centerville	[illegible] & Sons, Inc.	particulate	order 7/31/75
Iowa Dubuque	Interstate Power Co.	particulate	order 9/1/75
Iowa Salix	Iowa Public Service Co. (George Neal Station)	particulate	Amended order 9/5/75
Iowa Sioux City	[illegible] Construction Co.	particulate	Draft order 10/20/75 issued 1/76
Iowa	[illegible]	particulate	order 10/29/75

[illegible]	[illegible]	[illegible]	TYPE OF ACTION
[illegible]			
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Revised order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Iowa [illegible]	[illegible]	Particulate	Order [illegible]
Kansas [illegible]	[illegible]	Particulate Opacity	Order [illegible]
Kansas [illegible]	[illegible]	Opacity	Order [illegible]
Kansas [illegible]	[illegible]	Opacity	Order [illegible]
Kansas [illegible]	[illegible]	Particulate	[illegible] Order [illegible]
Kansas [illegible]	[illegible]	Particulate	Order [illegible]
Kentucky.	[illegible]	Particulate [illegible]	[illegible] order [illegible]

STATE/CITY	COMPANY/TYPE OF SOURCE	POLLUTANT INVOLVED	TYPE OF ACTION
Louisville			7/22/75
Kentucky, Louisville	[illegible]	Particulate matter	Consent order issued 8/29/75
Kentucky, Louisville	B.F. Goodrich	Particulate matter	Consent order issued 7/22/75
Kentucky, Louisville	Falls City Brewing Co.	Particulate matter	Consent order issued 8/29/75
Kentucky, Louisville	[illegible] Printing Corp.	Hydrocarbon emissions	Consent order issued 8/29/75
Kentucky, Louisville	City of Louisville	Particulate matter	Consent order issued 8/29/75
Kentucky, Louisville	International Harvester	Hydrocarbon emissions	Consent order issued 3/29/75
Kentucky, Louisville	Henry Vogt Machine Co.	Particulate matter	Consent order issued 11/24/75
Kentucky, Louisville	Louisville Gas & Electric Co. (6 facilities)	Sulfur oxide emissions 12/5/75	Consent order issued
Kentucky, Louisville	Louisville Gas & Elec. Co. Cane Run 4, 5 & 6	SO2	NOV 9/29/75
Kentucky, Louisville	General Electric Co. Appliance Park	Part.	NOV 12/9/75
Kentucky, Louisville	Louisville Gas & Elec. Co. Mill Creek Units 1 & 2	SO2	NOV 12/29/75
Louisiana, Bastrop	International Paper Co. (Louisiana Mill) [illegible] pulping mill		particulates, TRS Order 12/12/75
Louisiana Cotton Valley	Cotton Valley Solvents Co. Truck Loading Facility	Hydrocarbons	NOV 7/21/75 order 12/30/75
Louisiana	Continental Solvents Co.	particulates	NOV 7/31/75

[illegible]	[illegible]	[illegible]	TYPE OF ACTION
[illegible]	[illegible]		Termination of NOV [illegible]
[illegible]	[illegible]	[illegible]	NOV [illegible] Termination of NOV [illegible]
[illegible]	[illegible]	[illegible]	NOV [illegible]
[illegible]	[illegible]	particulate, [illegible]	NOV [illegible]
[illegible]	[illegible]	[illegible]	NOV [illegible]
[illegible]	[illegible]	particulate, VE	NOV [illegible]
[illegible]	[illegible]	particulate, [illegible]	NOV [illegible]
[illegible]	[illegible]	particulate, [illegible]	NOV [illegible]
[illegible]	[illegible]	particulate, VE	NOV [illegible]
[illegible]	[illegible]	[illegible]	NOV [illegible]
[illegible]	[illegible]	particulate, VE	NOV [illegible]
[illegible]	[illegible]	particulate, VE	other [illegible]
[illegible]	[illegible]	particulate, VE	other [illegible]

[illegible]	[illegible]	POLLUTION PROBLEM	TYPE OF ACTION
	wood pulping mill		
Louisiana, Springhill	International Paper Co. Springhill Mill wood pulping mill	particulate, V/E	order 12/12/75
Louisiana, Bastrop	International Paper Co. Bastrop Mill wood pulping mill	particulate, V/E	order 12/12/75
Louisiana, [illegible]	[illegible] Parish Police Jury-solid waste dump	particulate (open burning)	Termination of NOV 9/29/75
Louisiana, Florien	[illegible] Plywood Co., Inc., Florien Plywood Plant - conical wood waste burner & sander dust burner	particulate V/E	Termination of NOV 11/12/75
Louisiana, DeRidder	International Paper Co., wood treating plant - conical wood waste burner	particulate V/E	Termination of NOV 12/3/75
Louisiana, [illegible]	[illegible] Burn Camp incinerator	particulate V/E	Termination of NOV 12/3/75
Louisiana, [illegible]	[illegible] Lumber Co. conical wood waste burner	particulate V/E	Termination of NOV 12/3/75
Maine, Winslow	Scott Paper Co. Winslow pulp mill	SO_2 mass emission	order
Maine, Jay	International Paper Co. Androscoggin Mill/Kraft Recovery boiler	Particulate matter mass emission	NOV 8/13/75 Order 11/5/75
Maine, Auburn	Androscoggin Foundry/Corp Iron cupola	Particulate matter mass emission	Order 11/12/75
Maine, [illegible]	[illegible] Co. asphalt batching operation	Particulate matter mass emission & opacity	NOV 12/15/75
Maine,	[illegible] Corp.	Particulate-mass	NOV 12/22/75

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	Particulate mass emission	NOV [illegible] Order [illegible]
[illegible]	[illegible]	Particulate mass emission	NOV [illegible] Order [illegible]
[illegible]	[illegible]	Particulate emission	NOV [illegible]
[illegible]	[illegible]	Particulate matter mass emission	NOV [illegible]/75
[illegible]	[illegible]	Particulate mass emission	Order [illegible]/75
[illegible]	[illegible]	Organic solvent installation of vapor recovery system	Consent order [illegible]/75
[illegible]	[illegible]	Particulate [illegible]	Order [illegible]
[illegible]	[illegible]	Organic material emission	NOV [illegible]/75
[illegible]	City of [illegible]	Particulate mass emission	NOV [illegible]/75 Order [illegible]/75
[illegible]	Municipal Incinerator	Particulate mass emission	Order 7/28/75
[illegible]	[illegible]	Organic material	NOV 6/26/75
	Spray paint operation	Mass emission	Order 9/8/75

[illegible]	[illegible]	POLLUTION PROBLEM	TYPE OF ACTION
Massachusetts, [illegible]	[illegible] [illegible]	Organic material mass emission	NOV 6/26/75 Order 6/26/75
Massachusetts, [illegible]	[illegible] Mfg. Co. [illegible]	Organic material mass emission	Consent order 7/7/75
Massachusetts, [illegible]	[illegible] Mills [illegible]	Particulate mass emission	order 8/26/75
Massachusetts, [illegible]	City of [illegible] Municipal incinerator	Particulate mass emission	NOV 12/2/75 Order 12/5/75
Massachusetts, [illegible]	General Dynamics Boiler	Particulate mass emission	NOV 7/31/75 Order 10/31/75
Massachusetts, Weymouth	Town of Weymouth Municipal incinerator	Particulate emissions	Order 7/7/75; civil action instituted; consent decree lodged with court on 1/6/7[illegible]
Massachusetts, [illegible]	Sun Oil Co. Gas loading terminal	Hydrocarbons	Consent order 6/18/75
Massachusetts, Chelsea	Gulf Oil Co., Gas loading terminal	Hydrocarbons	NOV 6/25/75
New Jersey, Little Falls	North Jersey Foundry Co. Inc.	Particulate	Consent order 6/22/75
Michigan, Detroit	Detroit Public Lighting Dept. [illegible]	particulate	NOV 5/26/75
[illegible]	[illegible], Corp.	Particulate matter	Consent order issued 12/12/75
[illegible]	[illegible] Asphalt Co.	Failed to respond to [illegible] request for	Consent order issued 9/5/75

[illegible]	[illegible]	POLLUTANT	TYPE OF ACTION
		Failure to submit information.	
[illegible]	[illegible]	Failure to respond to EPA request for process and emission information.	Consent order issued 12/24/75
[illegible]	[illegible]	Particulate matter	NOV 8/?/75
[illegible]	[illegible]	particulate	NOV ?/?/75
[illegible]	[illegible]	opacity	NOV 8/28/75
[illegible] North Kansas City	[illegible]	particulate and SO2	NOV 8/15/75
[illegible]	[illegible]	Violation of both particulate, emission and air quality standards	NOV 8/5/75
[illegible]	[illegible]	Violation of particulate emission regs.	NOV 8/5/75
[illegible]	[illegible]	Violation of particulate emission std.	NOV 9/12/75
Nevada, [illegible]	Kennecott Copper Corp., Nevada Mines Division copper smelter	Violation of federally promulgated sulfur oxide and particulate matter reg.	NOV 9/12/75
New York, [illegible] City	[illegible] City Incinerator	Particulate	Order 7/28/75 Amended 12/24/75
New York, Lawrence	Sanitary District #1 Incinerator	Particulate	Order 7/28/75
New York, Long Beach	Long Beach Incinerator	Particulate	Order 7/28/75

[illegible]	[illegible]	POLLUTION PROBLEM	TYPE OF ACTION
New York, Valley Stream	Valley Stream Incinerator	Particulates	Order 7/28/75
New Jersey, [illegible]	[illegible] Foundry & Machine Co.	Particulates	NOV 7/9/75 Consent order 8/28/75
New Jersey, [illegible]	Lafferty Asphalt Co., Inc.	NSPS-noncompliance performance tests	NOV & order 12/9/75
New Jersey, Linden	Public Service Elec. & Gas Co.	Opacity	Consent order 7/18/75
New York, Green Island	Bendix Corp. [illegible] Mat'l Div.	NESHAPS-Asbestos	NOV & Order 7/28/75
New Jersey, [illegible]	[illegible] Mills	Opacity	NOV 10/31/75
New Jersey, Jersey City	[illegible] Metal Processing Corp.	Particulates	NOV 11/11/75
New Jersey, Newark	[illegible] Foundry Co.	Particulate V/E	NOV 11/13/75
New York, Plum Island	Plum Island Animal Disease Center (Dept. of Agriculture)	Particulates	Consent agreement 11/19/75
New York, Buffalo	Buffalo Municipal Incinerator	Particulates	Order 9/28/75
New York, [illegible]	[illegible], Inc.	Hydrocarbons	Order 7/30/75
New York, Buffalo	[illegible] Coke Corp.	Failure to respond to Section 114 request for information	Order 8/28/75
New York, Freeport	Freeport Incinerator	Particulate	Order 7/28/75
New York, Utica	[illegible]	Particulate emissions	NOV 9/2/75
New York, [illegible]	Niagara Mohawk Power Corp.	Sulfur content in fuel particulate emissions	NOV 7/31/75

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	Particulate	[illegible]
[illegible]	[illegible]	Particulate	[illegible]
[illegible]	[illegible]	Particulate	[illegible]
[illegible]	[illegible] [illegible]	[illegible]	[illegible]
North Carolina, [illegible]	[illegible] Quarry [illegible]	Particulate	NOV 11/21/75
North Carolina, [illegible]	[illegible] Quarry [illegible]	Particulate	NOV 11/21/75
North Carolina, [illegible]	R.J. Reynolds Tobacco Co. [illegible] "B"	Particulate	NOV 11/21/75
North Carolina, [illegible]	[illegible] Corp. Bark Boiler	Particulate	NOV 11/21/75
North Carolina, [illegible]	[illegible] [illegible]	Visible Emissions	NOV 11/21/75
North Carolina, [illegible]	Carolina [illegible] Corp. [illegible] Rotary [illegible]	Particulate & SO_2	NOV 11/21/75
[illegible]	[illegible] Boilers	Particulate	Consent order 7/18/75

[illegible]	[illegible]	POLLUTANT INVOLVED	TYPE OF ACTION
Ohio Youngstown	Youngstown Sheet & Tube Brier Hill Steel Works	particulate and S/O	consent order 7/23/75
Ohio [illegible]	Youngstown Sheet & Tube Campbell Steel Works	particulate and S/O	consent order 7/25/75
Ohio [illegible]	[illegible] Electric	particulate and S/O	consent order 7/23/75
Ohio [illegible]	[illegible] Foundry	particulate and S/O	consent order 7/23/75
Ohio Philo	Ohio Ferro Alloys Corporation, [illegible]	particulate and S/O	consent order 7/31/75
Ohio [illegible]	Whirlpool, Inc.	particulate	order 7/1/75
Ohio [illegible]	[illegible] Co.	particulate	order 7/8/75
Ohio Warren	Copperweld Spec. Steel	particulate	order 7/7/75
Ohio [illegible]	Allied Chemical-Solvay Div. [illegible]	particulate & S/O	NOV 8/6/75
Ohio Mansfield	Ohio Brass Co. [illegible]	particulate	consent order 8/6/75
Ohio Portsmouth	Detroit Steel Corp/Cyclops-Detroit Steel Div. Open Hearth Furnaces	particulate & S/O	order 8/11/75
Ohio [illegible]	Gray Iron Foundry Corporation [illegible]	particulate	consent order 8/11/75
Ohio [illegible]	[illegible] Co./[illegible] Cement Div. Cement Kilns	particulate & S/O	consent order 8/11/75
Ohio [illegible]	Ohio Lime Co.	particulate	order 7/8/75
Ohio [illegible]	[illegible]	particulate	order 10/9/75

[illegible]	[illegible]	POLLUTANT INVOLVED	TYPE OF ACTION
Ohio Zanesville	[illegible]	particulate	order 10/23/75
Ohio [illegible]	[illegible] [illegible]	particulate & SO2	consent order 9/5/75
Ohio Piqua	City of Piqua [illegible]	particulate	order 9/5/75
Ohio [illegible]	[illegible] Chemical Plant - boilers	particulate	consent order 9/8/75
Ohio [illegible]	[illegible] [illegible]	particulate	consent order 9/26/75
Ohio [illegible]	[illegible] Chemical Inc. [illegible]	particulate	NOV 9/25/75
Ohio [illegible]	[illegible] Chemical Co. Boilers	particulate	NOV 9/25/75
Ohio [illegible]	[illegible]	particulate	NOV 7/1/75
Ohio Warren	Copperweld Steel	particulate	NOV 7/1/75
Ohio Cleveland	Highland View Hospital	particulate	NOV 7/28/75
Ohio Painesville	City of Painesville Municipal Light Plant Boilers	NSPS for SO2	NOV 11/24/75
Ohio Cleveland	City of Cleveland/Lake Road Gen. Sta. Coal fired Boilers	particulate	NOV 12/18/75
Ohio [illegible] & [illegible]	[illegible] Electric	particulate	NOV 7/23/75

[illegible]	[illegible]	POLLUTANT INVOLVED	TYPE OF ACTION
Ohio [illegible]	Youngstown Sheet & Tube Co. [illegible]	particulate	NOV 7/25/75
Oregon Toledo	Georgia Pacific Corporation pulp mill	VE	NOV 12/?/75
Oregon [illegible]	[illegible] asphalt plant	violation of NSPS reporting	NOV 10/6/75
Oregon Springfield	Weyerhaeuser Co. lime kilns	particulate matter	consent order 6/1/75
Oregon Portland	[illegible] Co. cyclones	particulate matter	consent order 6/1/75
Oregon [illegible]	Louisiana Pacific Corp. wigwam burner	VE	order 12/18/75
Oregon Portland	Cargill Inc. grain elevators	VE	Consent order 11/17/75
Oregon Troutdale	Reynolds Aluminum Co.	Opacity	NOV 10/1/75
Oregon Portland	Louis Dreyfus Co. grain elevators	Particulate matter	Consent order 11/26/75
Oregon Portland	Bunge Corporation grain elevators	Particulate matter	order 9/26/75
Oregon [illegible]	Weyerhaeuser Corporation Particle board plant	Particulate matter and opacity	NOV 11/4/75
Oregon Baker	Ellingson Lumber Co. wigwam waste burner	particulate matter VE	order 11/4/75
Oregon Burns	Edward Hines Lumber hog fuel boilers	particulate matter	NOV 9/22/75
Oregon Tillamook	Louisiana Pacific wigwam burner	VE	NOV 11/18/75
Oregon	[illegible] Co.	particulate matter	consent order 6/1/75

[illegible]	[illegible]	Pollutant Emitted	Type of Action
[illegible]	[illegible] manufacturing plant		
[illegible]	[illegible]	particulate matter	consent order 8/1/75
[illegible]	[illegible]	particulate matter	consent order 5/1/75
[illegible]	[illegible]	particulate matter	consent order 8/1/75
[illegible]	[illegible]	failure to respond to Section 114 request	order 9/1/75
[illegible]	[illegible]	failure to respond to Section 114 request	order 9/1/75
[illegible]	[illegible]	particulate matter mass emission	order 11/14/75
[illegible]	[illegible]	particulate matter mass emission	NOV 3/7/75 order 12/75
[illegible]	[illegible]	particulate & SO2	NOV 3/3/75
[illegible]	[illegible]	particulate fugitive dust	NOV 3/12/75 order 9/19/75
[illegible]	[illegible]	particulate visible & SO2 emission	order 10/9/75
[illegible]	[illegible]	particulate visible & SO2 emission	NOV 10/29/75
[illegible]	[illegible]	SO2 visible emission	consent order 1/3/75
[illegible]	[illegible]	particulate matter mass emission	order 7/11/75
Pennsylvania	Allied Chemical Corp. Industrial Chemical Plant	SO2	order 7/11/75
Pennsylvania	[illegible] Co.	particulate matter	order 3/4/75

LOCATION	COMPANY/TYPE OF SOURCE	POLLUTANT PROBLEM	TYPE OF ACTION
[illegible]	[illegible]	mass emission	
Pennsylvania [illegible]	[illegible] [illegible] products	particulate matter mass emission	order 7/25/75
Pennsylvania [illegible] Township	[illegible] plastic production	SO2 mass emission	order 7/25/75
[illegible]	[illegible] Co.	failure to respond to Section 114 request	order 8/5/75
Pennsylvania [illegible]	[illegible] Steel Corp.	failure to respond to Section 114 request	order 8/5/75
Pennsylvania [illegible]	[illegible] [illegible] Concrete	visible emission	NOV 7/22/75 amend. order 9/25/75
Pennsylvania Palmerton	New Jersey Zinc	particulate & visible emission	NOV 12/16/75
Pennsylvania	[illegible]	visible emissions & particulates	NOV 7/11/75
Pennsylvania Butler Co.	Armco Steel electric arc furnace	particulate matter fugitive	consent order 12/29/75
Pennsylvania [illegible]	[illegible] Malleable Inc. boiler	particulate matter mass emission	consent order 10/3/75
Pennsylvania Chambersburg	Borough of Chambersburg electric power plant utility boiler	particulate matter mass emission	consent order 11/13/75
Pennsylvania [illegible]	[illegible] Spring Foundry Co. grey iron cupola	particulate fugitives & opacity	consent order 12/29/75
Pennsylvania Elrama	Duquesne Light Co. Elrama Station/utility boiler	particulate mass emission	NOV 12/15/75
Pennsylvania	Aluminum Co. of America	particulate mass	consent order 10/31/75

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	SO2 data collection	Consent Order 10/21/75
[illegible]	[illegible]	NESHAPS-certification testing	NOV Order 2/25/75
[illegible]	[illegible]	Particulate	Consent Order 7/1/75
[illegible]	[illegible]	[illegible]	Consent Order 10/21/75
[illegible]	[illegible]	NSPS-Portland Cement Plant	NOV 9/12/75
[illegible]	[illegible]	Opacity	Order 12/31/75
[illegible]	[illegible]	Visible emission and organic compounds	Order 9/12/75
[illegible]	[illegible] [illegible]	PCB's mass emission	Order to comply with [illegible]
[illegible]	[illegible] [illegible]	Particulate [illegible]	NOV [illegible] Order [illegible]
[illegible]	[illegible]	Particulate matter	Consent order [illegible]
[illegible]	[illegible]	Violation of particulate emission std	NOV [illegible]
[illegible]	[illegible]	Violation of particulate emission std	NOV [illegible]
[illegible]	[illegible]	Violation of particulate	NOV [illegible]
[illegible]	[illegible]	Violation of particulate	NOV [illegible]

JURISDICTION	COMPANY/PLANT OR SOURCE	POLLUTION PROBLEM	TYPE OF ACTION
Rapid City			
Utah, Magna	[illegible], Inc. Coal-Fired Industrial Boiler	violation of particulate emission std	NOV 11/13/75
Utah, Rowley	NL Industries, Magnesium Div. Spray Dryer Exhaust Systems	violation of particulate emission std	Order 10/21/75
Utah, Leamington	Mountain States Lime, Inc. 4 vertical lime kilns	violation of particulate emission std	NOV 7/23/75
Utah, Leamington	Mountain States Lime, Inc. Hydrator Stack	violation of particulate emission std	NOV 7/23/75
Utah, Leamington	Mountain States Lime, Inc. Secondary Crusher & Screening System	violation of particulate emission std	NOV 7/23/75
Utah, Leamington	Mountain States Lime, Inc. Rock Pulverizer Stack	violation of particulate emission std	NOV 7/23/75
Utah, Ogden	Weber County Corp. Municipal Incinerator Unit #2	violation of particulate emission std	NOV 7/24/75
Utah, Ogden	Weber County Corp. Municipal Incinerators #1 and #3	violation of particulate emission std	Order 10/21/75
Utah, Geneva	U.S. Steel Power Plant	violation of particulate emission std	Order 9/29/75
Vermont, Burlington	City of Burlington Boiler	Particulate mass emission V/E	Order 7/7/75
Vermont, Hyde Park	Vermont Asbestos, Inc.	Asbestos visible emissions	Order 10/10/75
Virgin Islands, St. Croix	Martin Marietta Corp. (St. Croix Facility)	SO_2 sulfur fuel content	NOV 10/23/75
Virgin Islands, St. Thomas	St. Thomas Dairies Co., Ltd.	Operating w/o complying w/ new source review requirements 40 CFR 52.1775(b)	NOV 9/16/75
Wisconsin	WEPCO-Oak Creek Power Station	Particulate matter mass	Order 9/23/75

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LOCATION a/	COMPANY/TYPE OF SOURCE	POLLUTANT INVOLVED	TYPE OF ACTION
West Virginia Follansbee	Wheeling-Pittsburgh Steel Co.	Particulate & visible emissions	order 12/?/75
Wisconsin Milwaukee	American Motors Corporation auto mfg.	hydrocarbon and particulate	NOV 7/28/75
Wisconsin Kenosha	American Motors Corporation auto mfg. (main plant)	hydrocarbon	NOV 7/28/75
Wisconsin Kenosha	American Motors Corporation auto mfg. (main lake front plant)	hydrocarbon	NOV 7/28/75
Wisconsin Nekoosa	Nekoosa Paper Co. Kraft Pulp/paper mill	particulate	NOV 9/23/75
Wisconsin Milwaukee	Sargent Inc. coil coating operation	hydrocarbon	consent order 9/23/75
Wisconsin Milwaukee	Sargent, Inc. coil coating operation	hydrocarbon	NOV 7/2/75